WEST SANTA ANA BRANCH TRANSIT CORRIDOR PROJECT

Draft EIS/EIR Chapter 4: Affected Environment and Environmental Consequences
Part 2

July 2021

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

TABLE OF CONTENTS

Tables

Figures

4.9 Geotechnical, Subsurface, and Seismic

This section summarizes the current applicable regulatory setting, existing conditions, and potentially significant impacts associated with the geotechnical, subsurface, and seismic conditions that underlie the WSAB Transit Corridor. Information in this section is based on the *West Santa Ana Branch Transit Corridor Project Final Geotechnical, Subsurface, and Seismic Impact Analysis Report* (Metro 2021e), attached as Appendix O of this Draft EIS/EIR. This section also includes discussions of the environmental effects associated with naturally occurring oil and gas hazards in Sections 4.9.3.3 (operation) and 4.19.3.9 (construction).

4.9.1 Regulatory Setting and Methodology

4.9.1.1 Regulatory Setting

Federal

There are no federal policies or regulations directly applicable to the Project's geology and soils analysis.

State and Local

Alquist-Priolo Earthquake Fault Zoning Act: The California legislation protecting the population of California from the effects of fault-line ground-surface rupture is the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code 2621 et seq.). This legislation was enacted in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. The Alquist-Priolo Act (California Geological Survey [CGS] 2018) is the state's principal guidance to prevent the construction of habitable structures on the surface trace of active earthquake faults. The Alquist-Priolo Act only addresses the hazard of surface fault rupture and does not consider other earthquake hazards.

Seismic Hazards Mapping Act: The California Seismic Hazards Mapping Act (Public Resources Code 2690-2699.6) became effective in 1991 to identify and map seismic hazard zones for the purpose of assisting cities and counties in preparing the safety elements of their general plans and to encourage land use management policies and regulations that reduce seismic hazards. The recognized hazards include strong ground shaking, liquefaction, landslides, and other ground failure. The Act has resulted in the preparation of maps delineating liquefaction and earthquake-induced landslide Zones of Required Investigation.

Surface Mining and Reclamation Act: The State Surface Mining and Reclamation Act (Public Resources Code 2710 et seq.) became effective in 1975 to establish policy for the reclamation of mined lands and the conduct of surface mining operations.

California Building Code: In addition to the preceding state acts, California regulations protecting the public from geo-seismic hazards are contained in the 2016 CCR Title 24, Part 2 California Building Code (CBC). For surface structures, other than guideways and bridges, the MRDC require conformance with the LA County Building Code, which is based on the CBC. The CBC dictates the requirements for design of structures and includes requirements to perform site-specific geotechnical investigations and prepare design reports in accordance with the CBC-specified methodologies. These investigations and reports would be conducted in concert with and during the final design stage of the Project and would address the

hazards (for surface structures other than guideways and bridges) discussed in this section of this Draft EIS/EIR.

California Division of Occupational Safety and Health (Cal/OSHA): Construction activities included with the Build Alternatives are subject to occupational safety standards for excavation, shoring, and trenching as specified in Cal/OSHA regulations (CCR, Title 8). This includes the Cal/OSHA normal ventilation requirements for underground work areas (including tunnels), which includes the following:

- Fresh air must be supplied to all underground work areas in sufficient amounts to prevent any dangerous or harmful accumulation of dusts, fumes, mists, vapors, or gases. If natural ventilation does not provide the necessary air quality through sufficient air volume and air flow, the employer must provide mechanical ventilation such that each employee working underground has at least 200 cubic feet of fresh air per minute.
- When performing work that is likely to produce dust, fumes, mists, vapors, or gases, the linear velocity of air flow in the tunnel bore, shafts, and all other underground work areas must be at least 30 feet per minute. When such operations are complete, the ventilation systems must exhaust smoke and fumes to the outside atmosphere before resuming work. When drilling rock or concrete, dust control measures such as wet drilling, vacuum collectors, and water mix spray systems must be used to maintain dust levels within limits set in Code of Federal Regulations 1926.55, which includes gases, vapors, fumes, dusts, and mists.

Los Angeles County Metropolitan Transportation Authority: The MRDC establish the design criteria for Metro's transit projects, including aboveground and belowground features of LRT projects. Section 5 (Structural/Geotechnical) of the MRDC states the following:

> The criteria and codes specified herein shall govern all matters pertaining to the design of Los Angeles County Metropolitan Transportation Authority (Metro) owned facilities including bridges, aerial guideways, cut-and-cover subway structures, tunnels, passenger stations, earth-retaining structures, surface buildings, miscellaneous structures such as culverts, sound walls, and equipment enclosures, and other non-structural and operationally critical components and facilities supported on or inside Metro structures. These criteria also establish the design parameters for temporary structures. The main reference document controlling the seismic design of Metro facilities under these criteria is Section 5 Appendix, Metro Supplemental Seismic Design Criteria.

The MRDC provide guidance on the procedures and methods to be used during design of structures. Section 5 of the MRDC also provides detailed design requirements that address the geologic conditions and hazards discussed in this section. Specifically, MRDC Section 5.6 (Geotechnical) provides geotechnical design requirements, including subsurface investigation and laboratory testing, geotechnical reporting, temporary excavations, and detailed foundation design requirements that would address the hazards discussed in this section.

All new structures must be designed to resist the earthquake forces and ground displacement stipulated in the criteria. The MRDC Section 5 Appendix (Metro Supplemental Seismic Design Criteria) dictates the required seismic performance criteria for structures. For structures other than aboveground and belowground guideways and bridges, such as

buildings and some retaining walls, the MRDC require conformance with the LA County Building Code, which is based on the CBC. For bridges and aerial structures, the MRDC require mandatory conformance with the latest version of the Caltrans Bridge Design Specifications, Caltrans Seismic Design Criteria (Caltrans 2017), and American Association of State Highway and Transportation Officials Load and Resistance Factor Design Bridge Design Specifications or the American Railway Engineering and Maintenance-of-Way Association (AREMA) specifications, as applicable, depending on the location of the structure. Retaining walls subject to LRT loading will also be designed in conformance with the American Association of State Highway Transportation Officials (AASHTO) with Caltrans Amendments, per MRDC Section 5.1.3.C.5. Underground structures would be designed to conform with Metro design specifications for underground guideways and structures.

The Metro Supplemental Seismic Design Criteria (Metro 2017g) would be used during the final design stage of the Project to provide seismic design recommendations for the Build Alternatives. In concert with these recommendations, Metro has a two-level design approach for both aerial and underground structures:

1. The operating design earthquake (ODE), defined as an earthquake event likely to occur only once during the design life, where structures are designed to respond without significant structural damage. The ODE has a 150-year average return period.
2. The maximum design earthquake (MDE), defined as an earthquake event with a low probability of occurring during the design life, where structures are designed to respond with repairable damage and to maintain life safety. The MDE has a 2,500-year average return period.

The Metro Supplemental Seismic Design Criteria also require the following:

- Bridges, aerial, and underground structures would be designed in accordance with the Metro MDE, which has a 2,500-year average return period.
- Surface structures not covered by the Caltrans seismic design criteria would be designed in accordance with the LA CBC, which uses the Maximum Considered Earthquake, with a 2,500-year average return period.
- Bridges supporting railroad loads would be designed in accordance with the requirements of the applicable railroad, or in accordance with AREMA standards in lieu of specific railroad requirements. The average return period for AREMA-owned facilities varies, depending on the structure importance classification, and ranges from a 50- to 2,400-year average return period.

If a structure is governed by more than one set of seismic design criteria and a conflict exists, the most critical set of requirements would apply to the design.

When tunneling is included in a project, Metro mandates that the Tunnel Advisory Panel (TAP) review designs with respect to subsurface gas and other tunneling-related hazards. The members of the TAP have extensive experience with tunneling projects in the Los Angeles Basin and seek to verify that the requirements of the MRDC are successfully implemented.

City of Los Angeles

Methane Ordinance: In 2004, the City of Los Angeles adopted the City of Los Angeles Methane Ordinance (No. 175790), which requires compliance with the Methane Mitigation

Standards outlined in the Methane Seepage Regulations (Division 71, Section 91 7101 to 91 7109), and as directed and approved by the Los Angeles Department of Building and Safety (LADBS) and Los Angeles Fire Department. The ordinance outlines the general methane requirements for mitigation; testing, maintenance, and service of gas detection and mechanical ventilation systems; emergency procedures; application of Methane Seepage Regulations to locations or areas outside the methane zone and methane buffer zone boundaries; and additional remedial measures (General, Abandoned Oil Wells).

Additionally, the City of Los Angeles Department of Public Work's Bureau of Engineering has mapped potential methane zones and methane buffer zones where additional assessment is required. Specifically, the City of Los Angeles Municipal Code requires projects located within a methane zone or methane buffer zone to comply with the city's Methane Mitigation Standards as amended by Ordinance 175790 (LADBS 2004a).

Department of Building and Safety: The Methane Mitigation Standards require that an initial assessment for methane and hydrogen sulfide (H_2S) be completed in accordance with LADBS guidelines where the Affected Area for geotechnical, subsurface, and seismic resources (hereafter referred to as the geotech Affected Area) passes through oil fields, methane zones, and/or methane buffer zones. The initial assessment shall be conducted in accordance with 2014 LADBS Site Testing Standards for Methane (LADBS 2014).

Municipal Code: The City of Los Angeles Municipal Code, Chapter IX, Building Regulations, Article 1, Division 71, Methane Seepage Regulations (City of Los Angeles 2004), requires construction projects located within a methane zone or methane buffer zone to comply with the city's Methane Mitigation Standards to control methane intrusion emanating from geologic formations. Mitigation requirements are determined according to the actual methane levels and pressures detected in the subsurface at a site. Mitigation measures can include both active and passive ventilation systems to verify the exchange of air, gas barriers (membranes around basements and foundations), and sensors in interior spaces to monitor the presence of gas and its pressure.

4.9.1.2 Methodology

The geotech Affected Area is defined as the area within 250 feet of the Build Alternative alignments, including the proposed traction power substations, stations, and MSF site options. The 250-foot buffer extends out from the alternative alignment anticipated area of work/disturbance, including the MSF site options, Design Options 1 (MWD) and 2 (Add Little Tokyo Station), temporary (construction) areas, and permanent areas. Considering that the geotech Affected Area is relatively flat, the 250-foot width would cover potential impacts from the project upon the geology and soils of the area. Existing geologic and geotechnical data were reviewed to assess the geotech Affected Area for known geologic hazards and identify potential impacts. If stations or structures are proposed within or directly adjacent to known geologic hazard areas, the potential for an impact has been identified and assessed. Consistent with the requirements summarized in Section 4.9.1.1, additional geotechnical investigations would be performed during preliminary engineering and final design for the selected alternative to verify conditions.

To satisfy CEQA requirements, geology and soils impacts are analyzed in accordance with Appendix G of the *CEQA Guidelines*, identified in Section 4.9.5. Part (f) of the Geology and Soils portion of the CEQA Appendix G Checklist is addressed in Section 4.14.5.3, Paleontological Resources.

4.9.2 Affected Environment/Existing Conditions

4.9.2.1 Regional Geologic Setting

The geotech Affected Area is located within the Los Angeles Basin portion of the Peninsular Ranges geomorphic province of California. The Peninsular Ranges province is characterized by a series of northwest-trending mountains, valleys, and faults, all of which generally parallel the San Andreas Fault system. The Los Angeles Basin is a structural trough overlying bedrock formations between the Western Continental Shelf and the San Gabriel Mountains. Near the central part of the basin, this structural trough has been filled with nearly 30,000 feet of marine and alluvial deposits of the Quaternary (up to 2.6 million years old) and Tertiary (2.6 to 65 million year old) age (Yerkes et al. 1965). These Quaternary and Tertiary units are underlain by Cretaceous-age (65 to 145 million year old) crystalline bedrock. The geology of the geotech Affected Area is shown on Figure 4.9-1; given the scale of the figure, the limits of the geotech Affected Area are not illustrated.

4.9.2.2 Physiography and Topography

The geotech Affected Area is on a gently sloping (relatively flat) alluvial surface (composed of sediment deposited by a river, such as the inactive Los Angeles and San Gabriel River floodplains) within the Los Angeles Basin. Elevations along the geotech Affected Area vary from approximately 280 feet above mean sea level (msl) on the north end to 40 feet msl on the southeast end (United States Geological Survey [USGS] 1964a, 1964b, 1965, 1966a, and 1966b). Overall, the geotech Affected Area slopes toward the south and southwest.

The geotech Affected Area is transected by the concrete-lined Los Angeles River and Rio Hondo channels just west and east, respectively, of I-710, and the concrete-lined San Gabriel River channel just west of I-605 (Figure 4.9-1).

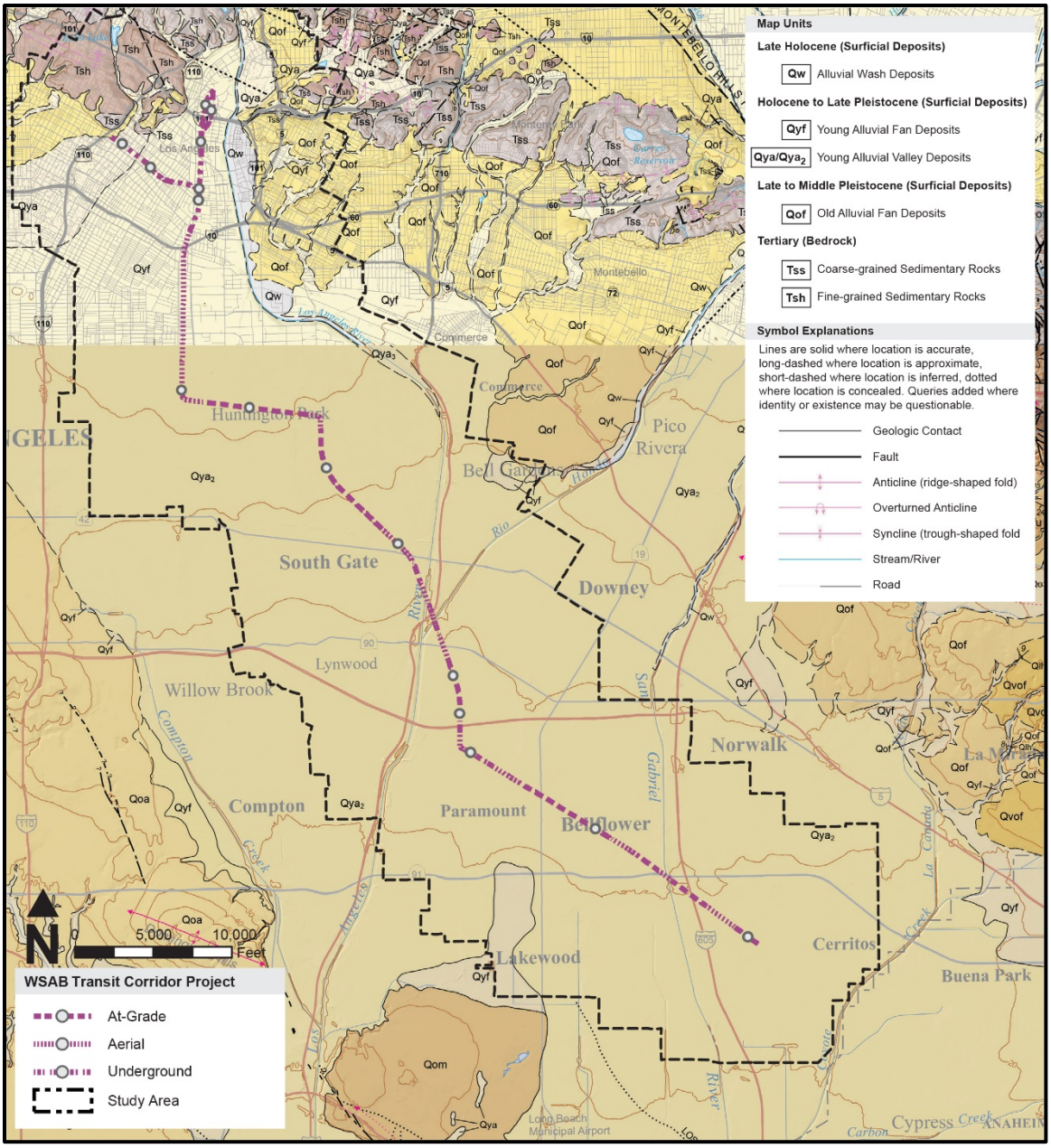
4.9.2.3 Stratigraphy

The following subsections summarize the geotech Affected Area geologic units. In addition to the mapped geologic units present in the geotech Affected Area (Figure 4.9-1), artificial fill soils overlie the alluvial deposits locally.

Artificial Fill Soil

Within the geotech Affected Area, artificial fill soils have been placed during the construction of some past projects to generally raise the grade (ground level) at a site or to replace soils that were considered detrimental to a proposed development. Based on information available from the Regional Connector project, artificial fill soils 5 to 20 feet deep are present along the Regional Connector alignment (Metro 2012a). The Regional Connector is a Metro project that has endpoints that overlap with the geotech Affected Area. The Regional Connector extends from a new underground Little Tokyo/Arts District Station to the existing 7th Street/Metro Center Station. Fills of similar thickness may be present throughout the geotech Affected Area, although local areas may be underlain by thicker fills. The composition of the fill soils is variable, depending on the source.

Figure 4.9-1. Geologic Map



Sources: Prepared by Jacobs in 2020 (based on information from Bedrossian et al. 2012; Saucedo et al. 2016)

Alluvial Soil

Various alluvial soil units (alluvial wash deposits [Qw], young alluvial fan deposits [Qyf], young alluvial valley deposits [Qya/Qya2], and old alluvial fan deposits [Qof], as shown on Figure 4.9-1) are present in the geotech Affected Area. These geologic units are similar in nature and generally consist of unconsolidated interbedded lenses and/or discontinuous layers of fine-grained sediment (silt and clay) and coarse-grained sediment (sand, gravel, cobbles, and boulders). Cobbles and boulders may be present locally within the geotech Affected Area. Within the downtown Los Angeles area's alluvial soils, cobbles, and boulders (3-foot-diameter and larger) are widespread but not uniformly distributed.

Sedimentary Bedrock

The approximate depth to the alluvial soil/bedrock contact varies within the downtown Los Angeles area. South of Randolph Street, bedrock would not be encountered as the alluvial sediments are expected to be present to depths greater than 1,000 feet below ground surface (bgs) (Yerkes et al. 1965).

Fernando Formation bedrock, a sedimentary unit generally consisting of soft, gray to black, vaguely bedded, claystone and siltstone, is present in the downtown Los Angeles area. Scattered hard concretions and thin hard layers occur within this unit. The depth to bedrock in the downtown Los Angeles portion of the geotech Affected Area varies from approximately 20 feet bgs to over 1,000 feet bgs. The Fernando Formation is represented by symbols Tss and Tsh on Figure 4.9-1.

4.9.2.4 Surface Water and Groundwater

Surface Water

The Project is transected (from west to east) by the concrete-lined Los Angeles River, Rio Hondo channel, and San Gabriel River. The geotech Affected Area drains by sheet flow to these major drainages or to secondary drainages, which all ultimately drain into the Pacific Ocean.

Groundwater

In the downtown Los Angeles portion of the geotech Affected Area, groundwater was reported at approximately 40 feet bgs in 2002 near U.S. Highway 101 (US 101) (Metro 2002); 20 feet bgs in 1993 (Law/Crandall 1994) at Union Station; 40 feet bgs in 2013 at the Regional Connector 1st/Central Avenue Station (Metro 2013c); and 30 feet bgs in 1983 and 2013 at the 7th Street/Metro Center Station) (Converse 1983; Metro 2013c). Caltrans as-built log of test boring sheets indicate that groundwater levels varied from 5 feet bgs in the 1950s at I-710 and the Los Angeles River, 40 feet bgs in the 1980s at I-105 and the Union Pacific Railroad crossing, and 20 feet bgs in the 1960s at I-605 and Artesia Boulevard.

The bedrock units that could impact the geotech Affected Area generally do not have a fixed groundwater table. However, the bedrock can hold and transport groundwater in the form of seepages present within local sandstone beds as well as fault and/or fracture zones. Based on experience with the underground excavation projects in the downtown Los Angeles area, such as the Metro Regional Connector, B (Red) Line, and D (Purple) Line, it is known that substantial amounts of groundwater inflows can be expected locally in alluvial deposits where situated below groundwater.

4.9.2.5 Faulting and Seismicity

General Setting

The Southern California region is seismically active because of the influence of several earthquake fault systems resulting from interaction between the Pacific and North American crustal plates. An active fault is defined by the Alquist-Priolo Earthquake Fault Zone Act as a sufficiently active and well-defined fault that has exhibited surface displacement within the last approximately 12,000 years. A potentially active fault is defined by the Alquist-Priolo Earthquake Fault Zone Act as a fault with a history of movement between approximately 12,000 and 1.6 million years ago. Some faults may be active but do not actually rupture the

ground surface; these faults are termed blind thrust faults. Hazards associated with active faults include fault-induced ground rupture, co-seismic deformation, and ground shaking.

No known active faults capable of ground rupture are mapped within the geotech Affected Area for the Build Alternatives and MSF site options, and the Project is not located in an Alquist-Priolo Earthquake Fault Zone (CGS 2016a through 2016e). Two active blind thrust fault systems underlie the geotech Affected Area. These fault systems do not extend to the ground surface and are not considered capable of ground rupture during an earthquake. However, movements along these faults do generate earthquakes, and surficial ground deformation (gentle folding of the ground surface) has been documented due to activity along some blind thrust faults. Known active and potentially active faults that are mapped within 5 miles of the geotech Affected Area are summarized in Table 4.9.1 and are described below. Nearby active and potentially active faults are shown on Figure 4.9-2.

Table 4.9.1. Summary of Nearby Active and Potentially Active Faults

Fault Name	Fault Type	Slip Rate[1] (millimeters per year)	Maximum Moment Magnitude[2] (M_{max})	Closest Distance to Geotech Affected Area (miles)[3]
Lower Elysian Park Fault	Blind thrust	0.1	6.7	0
Puente Hills Fault – Los Angeles Section	Blind thrust	0.9	6.9	0
Upper Elysian Park Fault	Blind thrust	1.9	6.6	0.8
Puente Hills Fault – Santa Fe Springs Section	Blind thrust	0.9	6.6	0.8
Los Alamitos Fault	Uncertain	Uncertain	Uncertain	2.6
Puente Hills Fault – Coyote Hills Springs Section	Blind thrust	0.9	6.8	3.1
Raymond Fault	Left-lateral[4] with reverse	2	6.7	4.5
Hollywood Fault	Left-lateral with reverse	0.9	6.6	4.7

Source: Caltrans 2017

Notes: [1] Slip rate is the estimated and averaged distance the fault moves on an annual basis.

[2] Maximum moment magnitude (M_{max}) is a scale used to measure earthquake magnitude. Moment magnitude measures the total energy released during an earthquake. This physical quantity is proportional to the fault slip multiplied by the area that the fault plane slips.

[3] Blind thrust faults: distance tabulated is the vertical projection of the blind thrust fault to the surface. Other faults: USGS and CGS 2006; see Figure 4.9-2.

[4] A left-lateral means that when standing perpendicular to the fault line, one side moves to the left relative to the other side. Reverse indicates that when the fault ruptures, one side is forced upward relative to the other side.

Figure 4.9-2. Fault Location Map

Sources: Prepared by Jacobs in 2020 (based on information from Caltrans 2017; USGS and CGS 2006)
Note: Fault locations are approximate. A Historic fault is a fault that has ruptured in the last 150 years. A Holocene-Latest Pleistocene fault is a fault that has ruptured in the last 15,000 years. A Late Quaternary fault is a fault that has ruptured in the last 130,000 years.

Nearby Active Faults

Surface Faults: The closest active faults capable of ground rupture near the geotech Affected Area are the Raymond Fault, approximately 4.5 miles north of the geotech Affected Area, and the Hollywood Fault, approximately 4.7 miles north of the geotech Affected Area (Figure 4.9-2). The geographic boundary between these two faults is the Los Angeles River.

One potentially active fault is located near the geotech Affected Area, the Los Alamitos Fault, which is mapped approximately 2.6 miles southwest of the geotech Affected Area in the vicinity of the San Gabriel River (USGS and CGS 2006). The exact location, slip rate, and potential earthquake magnitude have not been established specifically for the Los Alamitos Fault as it is a relatively new fault that is currently being studied. Yeats and Verdugo (2010) theorize that the Los Alamitos Fault is related to the Los Angeles Segment of the Puente Hills Blind Thrust Fault (PHBT) and the Newport-Inglewood Fault Zone, which is mapped farther southwest from the Los Alamitos Fault, as shown on Figure 4.9-2. The Southern California Earthquake Data Center indicates that the Los Alamitos Fault may be a part of the larger Compton-Los Alamitos Fault, located south of the Project.

Blind Thrust Faults and the Coyote Pass Escarpment

The geotech Affected Area is underlain by the active Upper Elysian Park Blind Thrust Fault (EPBT) and PHBT (Shaw and Suppe 1996; Shaw et al. 2002). These blind thrust faults are not included in an Alquist-Priolo Earthquake Fault Zone and are not considered capable of ground rupture; however, there is potential for co-seismic deformation (gentle folding of the ground surface) to occur in the geotech Affected Area in the downtown Los Angeles area related to the Coyote Pass escarpment of the EPBT (Oskin et al. 2000).

The location of the Coyote Pass escarpment in the vicinity of the geotech Affected Area is approximate because the escarpment in this area has been eroded away by the Los Angeles River. Based on the Coyote Pass escarpment studies conducted for the Regional Connector project (AMEC 2013), the Coyote Pass escarpment crosses North Alameda Street between Temple Street on the north and 4th Street on the south. The location of the escarpment in the geotech Affected Area was projected from this area at North Alameda Street to the west, where topographic expression of the feature is evident near SR 110. Based on this projection, the Coyote Pass escarpment continues westerly from North Alameda Street to an approximate location between 4th Street (on the north) and 9th Street (on the south) along Flower Street. The projected location of the escarpment is shown on Figure 4.9-3.

The projection of the PHBT Los Angeles Section to the ground surface intersects the geotech Affected Area for Alternatives 1, 2, and 3 in the general vicinity of Florence Avenue (Bergen et al. 2017 and Rollins et al., 2018). Because the PHBT is a much deeper feature than the EPBT (the EPBT is situated atop the PHBT (Shaw et al., 2002) and may merge with it at depth), direct evidence for surface expression (deformation) (such as the Coyote Pass Escarpment for the EPBT) has not been noted for the PHBT in the Los Angeles Basin. As an example, the 1987 Whittier Narrows Earthquake occurred on the PHBT, and rupture of the PHBT did not break the ground surface (Hauksson et. al. 1988). The PHBT fault does not penetrate Quaternary-aged sediments in the LA Basin; the fault tip is buried by the sediment, which is very broadly folded as a result of the fault (Rollins et al. 2018).

Figure 4.9-3. Escarpments

Sources: WSP 2019; Oskin 2000; Sieh 1997; AMEC 2013
Note: Escarpment locations are not exact and are a graphic representation of a broad area.

The EPBT and PHBT are considered in the seismic (ground shaking) design for the Build Alternatives. These faults and all other known active faults in the region are considered when developing the parameters that would be used during design of the project structures (see Section 4.9.1.1 for details on the required design criteria).

4.9.2.6 Seismic Hazards

Seismic Shaking

The geotech Affected Area is located within the seismically active region of Southern California and may be subject to seismic ground shaking over time. During an earthquake, seismic waves are produced that extend in all directions from the fault rupture. Seismic waves can produce strong ground shaking that is typically strongest near the fault and attenuates as waves move away from

the source. The severity of ground shaking is a function of the magnitude of the fault rupture; the distance from the fault to the geotech Affected Area; and the type, thickness, and condition of the underlying geologic materials in an area. Areas underlain by unconsolidated recent alluvium or fill (such as those anticipated in the geotech Affected Area) may amplify the strength and duration of strong ground motion. Significant seismic shaking can result in structural damage and potentially structural collapse. Preliminary seismic analysis was conducted for the geotech Affected Area using the USGS seismic design maps (American Society of Civil Engineers 2019). These maps consider the effects of a potential earthquake on all the known faults in the region.

Considering the conceptual level of the Project, the MDE (see Section 4.9.1.1) is used to provide a general frame of reference for the ground accelerations (the severity of ground shaking) that would be used in the design of the Project. USGS parameter PGA_M is the peak ground acceleration (PGA) corrected for site effects (i.e., subsurface conditions). The PGA is an estimate of the maximum ground shaking a site can experience over a specified period of time. The period of time considered is termed the average return period. The average return period is dictated by the MRDC, as discussed in Section 4.9.1.1. Based on available subsurface data from historic borings, soils within the upper 100 feet of the geotech Affected Area can be generally classified as Site Class D for this conceptual level of study. Using the 2017 USGS Seismic Design Maps, PGA_M varies along the geotech Affected Area, ranging from 0.94g (g = acceleration due to gravity) near the northern end (near US-101) to 0.72g near the southern end (near Pioneer Station). The actual PGA that would be used during the final design stage of the project structures would be developed as the Project designs progress, and would use the Site Class developed as a result of the geotechnical field investigation that would be performed for the Project.

Liquefaction

Soil liquefaction occurs in the upper 50 to 75 feet bgs when saturated, loose soils lose their strength because of excess pore water pressure caused by earthquake ground shaking. The space between the soil particles is completely filled with water, which exerts pressure on the soil particles, thereby influencing how tightly the soil particles are pressed together. Prior to an earthquake, the water pressure is static depending on the depth below the groundwater table; however, the shaking caused by an earthquake can increase the pore water pressure to a point where the soil loses strength and ground deformation can occur.

The primary factors affecting the possibility of liquefaction in a soil deposit are the intensity and duration of the earthquake shaking, the soil type, the relative density of the soil, the pressures of material above the soil, and the depth to groundwater. The types of soils most susceptible to liquefaction are clean, loose, uniformly graded, fine-grained sands; non-plastic silts that are saturated; and silty sands. When liquefaction occurs, the strength of the soil decreases and the ability of the soil to support structures is reduced. The potential impacts of liquefaction may include settlement of the ground surface, additional forces pushing down on foundation piles as a result of soil settlement above the liquefied layers, lateral spreading (similar to a landslide), and reduction of the shear strength of the liquefied soil, resulting in reduced load-carrying capacity. Liquefied soils can also exert additional dynamic pressures on retaining walls, which can cause them to tilt or slide.

Liquefaction-induced ground failure has historically been a major cause of earthquake damage in Southern California. As shown on Figure 4.9-4, portions of the geotech Affected Area in the downtown Los Angeles area, and the entire geotech Affected Area from the Huntington Park area to the Artesia area, are located in a Liquefaction Zone of Required Investigation. Liquefaction Zones of Required Investigation are areas that have historically experienced liquefaction, or areas where conditions favorable to liquefaction exist, as described above. The Seismic Hazards Mapping Act requires a detailed liquefaction evaluation when improvements are proposed within a CGS-delineated Zone of Required Investigation.

Seismically Induced Landslides

The potential for seismically induced landslides (landslides that are triggered by an earthquake) depends on the steepness of the slope, strength and structure of the soil/rock, groundwater depth and extent, and level of ground shaking. The geotech Affected Area is relatively flat and no significant slopes are present. The geotech Affected Area is not located in an Earthquake-induced Landslide Zone of Required Investigation, as shown on Figure 4.9-4.

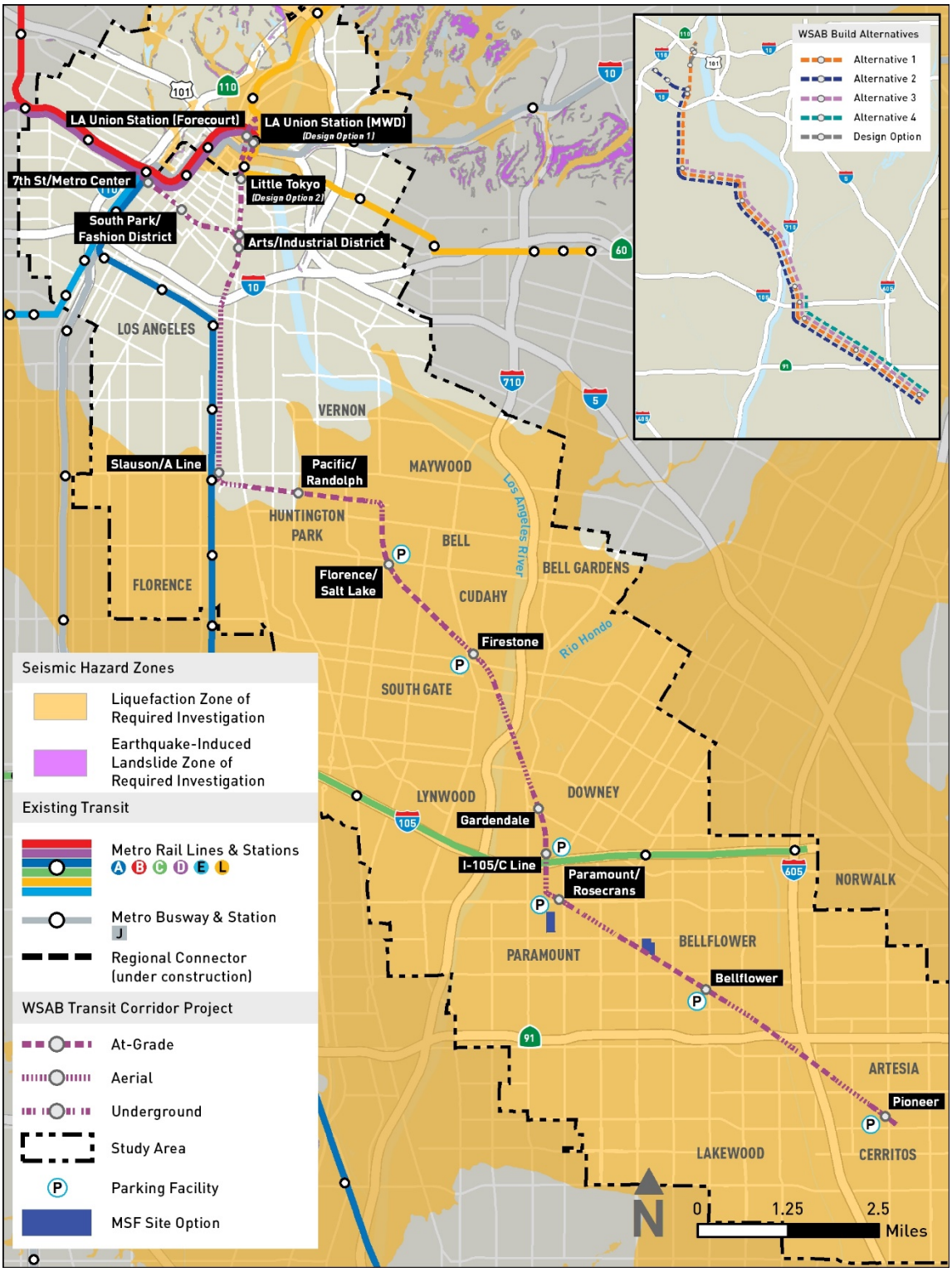
Seismically Induced Settlement

Loose, unsaturated granular soils are susceptible to settlement during an earthquake as the earthquake shaking causes the soil grains to rearrange and densify. This settlement can result in structural distress as the ground settles. Seismically induced settlement occurs primarily within loose to moderately dense sandy soils due to volume reduction during or shortly after an earthquake event. The artificial fill soils present along the alignment are expected to be undocumented and could include these loose soils. In addition, a portion of the alluvial soils along the alignment is anticipated to be loose to medium dense. Within the entire geotech Affected Area, unsaturated (above the groundwater table), undocumented fill soils and granular alluvial soils in the upper 50 to 75 feet bgs are potentially susceptible to seismically induced settlement.

Seismically Induced Inundation

Seismically induced inundation can occur when an earthquake causes catastrophic failure of a water-retaining structure such as a reservoir, dam, or levee, and subsequent flooding occurs due to the release of water from the structure. Based on a review of state inundation maps, floodwaters resulting from dam inundation are not expected to affect tunnel portals or underground stations included with Alternatives 1 and 2, including Design Options 1 and 2. The proposed portal and underground station locations are outside of the dam inundation areas identified by the California Dam Breach Inundation Maps produced by the California Department of Water Resources (DWR). The portals and underground stations for Alternatives 1 and 2 (including with Design Options 1 and 2) are within the City of Los Angeles. According to the 2017 City of Los Angeles Local Hazard Mitigation Plan, the probability of dam failure is low in today's regulatory environment (City of Los Angeles 2017b).

Figure 4.9-4. Seismic Hazard Zones Map



Sources: Prepared by Jacobs in 2021 (based on information from CGS 2016a through 2016e)

Tsunamis and Seiches

Tsunamis are waves typically generated offshore or within large, open bodies of water, primarily during an earthquake that occurs underwater, or by an underwater landslide. Seiches are waves generated within a large, closed body of water and can also be caused by an earthquake that occurs underwater, by an underwater landslide, or by ground shaking as a result of more distant earthquakes. At its closest point to the Project, the Pacific Ocean is more than 8 miles to the southwest. There are no closed bodies of water within or adjacent to the geotech Affected Area. Based on the distance between the geotech Affected Area and large bodies of water, the risk for tsunami or seiche in the geotech Affected Area is negligible.

4.9.2.7 Non-seismic Hazards

Potential non-seismic geologic hazards may exist within the geotech Affected Area, as summarized in the following subsections.

Slope Stability

The stability of a slope depends on the inclination, geology and geologic structure, soil and rock strength, and ground and surface water conditions within the slope. The geotech Affected Area is relatively flat and no significant slopes are present.

Expansive Soils

Expansive soils are clay-rich soils that swell and shrink with wetting and drying. The shrink-swell capacity of expansive soils can result in differential movement below or adjacent to a structure. This differential movement can result in significant damage to pavements, as well as foundations and associated structures. Clay-rich soils may exist locally within alluvial soils present in the geotech Affected Area. In addition, bedrock units also can exhibit expansive properties due to the clay content within the bedrock; this includes the Fernando Formation bedrock present within the shallow subsurface in the downtown Los Angeles area.

Ground Settlement and Collapsible Soils

Near the surface, ground settlement can occur when new loads are added to soil, or when a change in water levels results in a decrease in pore water pressures within compressible soils. Collapsible soils consist predominantly of sand- and silt-size particles arranged in a loose "honeycomb" structure. This loose structure is held together by small amounts of water-softening cementing agents, such as clay or calcium carbonate. When the soil becomes wet, these cementing agents soften and the honeycomb structure collapses and generates ground settlement. The entire geotech Affected Area is underlain by alluvial soils, as shown on Figure 4.9-1. The alluvial soils may be prone to collapse/settlement, which can result in differential movement beneath foundations, potentially causing structural distress.

Regional Subsidence

Regional subsidence results from the withdrawal of groundwater and/or hydrocarbons from the subsurface. DWR (2014) estimated the potential for future land subsidence within the geotech Affected Area to be low because groundwater withdrawal is restricted and managed, and, where performed, is compensated for by reinjection of water in volumes similar to what is withdrawn. Regional subsidence is not considered to be a significant hazard in the geotech Affected Area.

Naturally Occurring Oil and Gas

Naturally occurring oil and gas are present in the geotech Affected Area. As detailed in Section 4.10.2.5 of the Hazards and Hazardous Materials Section, portions of the Alternative 1 alignment (including Design Options 1 and 2) and Alternative 2 alignment are located upon the Union Station Oil Field (abandoned) and Los Angeles Oil Field. In addition, and as detailed in Section 4.10.2.5 of the Hazards and Hazardous Materials Section, oil and gas wells exist in the geotech Affected Area for Alternatives 1, 2, and 3. Oil and gas wells have not been identified in the geotech Affected Area for Alternative 4, Design Options 1 and 2, or the Paramount and Bellflower MSF site options.

Methane is a naturally occurring gas associated with the decomposition of organic materials. Methane gas is common in oil and gas fields and often occurs with H_2S gas. H_2S is produced by anaerobic decomposition of any type of organic or inorganic mater that contains sulfur.

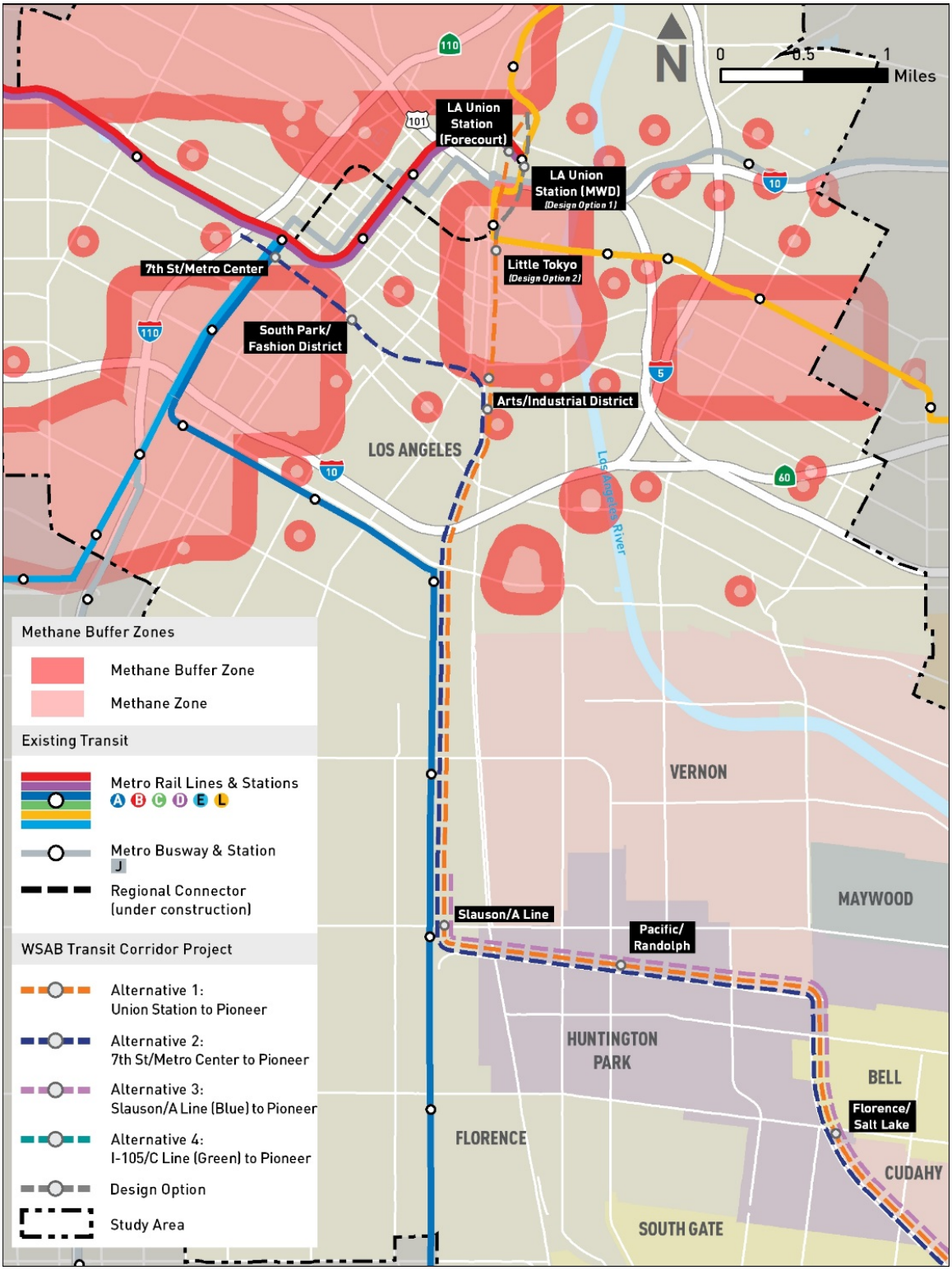
Methane and H_2S can also occur in a dissolved state in groundwater. Methane and H_2S are considered hazardous gases because of their explosive properties. H_2S is also highly toxic when inhaled and typically has a strong rotten-egg-like odor at lower, non-toxic levels. Methane and H_2S can be present in soil and/or groundwater. These gases can seep into tunnels and other excavations through soil and also through discontinuities (fractures, faults, etc.) in bedrock.

The City of Los Angeles Department of Public Works Bureau of Engineering mapped potential methane zones and methane buffer zones, and most recently updated its map in 2004, as shown with respect to the Build Alternative's geotech Affected Area, on Figure 4.9-5. Portions of the Alternative 1 and 2 (including Design Options 1 and 2) geotech Affected Area are located within a methane zone or methane buffer zone designated by the City of Los Angeles (2004). These methane zones and methane buffer zones have been established where there is a potential for naturally occurring methane to create a hazard to life and property.

Methane gas is explosive when its concentration is between 5 and 15 percent at atmospheric oxygen levels, but it is not toxic. Five and 15 percent are known as the lower and upper explosive limits, respectively. At higher percentages in air, it can be an asphyxiant because it displaces oxygen. Under normal atmospheric conditions, the oxygen content in air is approximately 21 percent by volume. If the oxygen content is reduced below 19.5 percent by volume through displacement by other gases, the air is oxygen-deficient according to U.S. Occupational Safety and Health Administration guidelines. Methane (density approximately 0.72 gram per liter at atmospheric pressure) is lighter than air and tends to rise through the ground and dissipate. Methane is moderately soluble in water. A total weighted average exposure of 1,000 ppm (0.1 percent) is included in the American Conference of Governmental Industrial Hygienists' (ACGIH) recommended practices (ACGIH 2001a). Peak values are allowed to be higher than 1,000 ppm, but a weighted average exposure of 1,000 ppm is used to prevent adverse health hazards for prolonged exposure.

H2S is potentially explosive at concentrations between 4 and 46 percent, and it is highly corrosive. H2S (density approximately 1.54 grams per liter at atmospheric pressure) is heavier than air. As such, at very high concentrations, H2S can accumulate within depressions or just above the groundwater table in the subsurface. It is highly soluble in water. According to the ACGIH (2001b), H2S gas has an exposure limit or threshold limit value (TLV)-time weighted average of 10 ppm for continuous exposure and 15 ppm for TLV-short-term exposure limit.

Figure 4.9-5. Methane and Methane Buffer Zones Map



Source: Prepared by Jacobs in 2020 (based on City of Los Angeles 2004)

This TLV-short-term exposure limit is the concentration to which it is believed that workers can be exposed continuously for a short period of time without suffering from irritation, chronic or irreversible tissue damage, or narcosis to a degree that would increase the likelihood of accidental injury, impair self-rescue ability, or materially reduce work efficiency, and provided that the daily exposure limit is not exceeded. A short-term exposure limit is defined as a 15-minute total weighted average exposure that should not be exceeded at any time during a workday. Cal/OSHA has these same exposure limits. The characteristic rotten-egg-like odor of H_2S is perceptible to most people at concentrations at or below approximately 1 ppm.

The following text is from the geotechnical baseline report prepared for the Regional Connector (Metro 2013c); similar conditions can be expected within the geotech Affected Area for Alternatives 1 and 2, including Design Options 1 and 2:

> Methane and hydrogen sulfide gases are anticipated to be encountered during the tunnel drive and the open cut excavations. These gases are expected to exist and seep through pore spaces and discontinuities, and would be generated from off-gassing of groundwater that flows into the excavation. Also, the excavated material exposed to the underground environment will emit these gases during handling and hauling. The concentration, pressure, and volume of these gases are expected to be sufficiently low that the inflow and off-gassing of these gases can be mitigated within the open cut, crossover cavern, crosspassage, and bored tunnel excavations through adequate ventilation, proper shotcrete application, and pressurized-face TBM [tunnel boring machine] tunneling with a precast concrete segmental tunnel lining as described in the Project Requirements. The underground work has been classified as "potentially gassy" by Cal/OSHA.

As indicated previously, naturally occurring oil and gas are present in the downtown Los Angeles area, as indicated by the methane zones and methane buffer zones (Figure 4.9-5). In addition, H_2S and petroliferous odors were reported during the geotechnical investigation for the Metro L (Gold) Line LRT bridge over US 101 (Metro 2002). Methane concentration levels detected along the Union Station to Civic Center portion of the Metro B/D (Red/Purple) Line alignment were less than 5 percent by volume (Metro 2011c). Methane concentration levels detected along the Fifth/Hill to Metro Center portion of the Metro B/D (Red/Purple) Line alignment were more than 50 percent by volume (Metro 2011c).

Radon gas is produced by the decay of uranium, which may be naturally present at varying levels in soil and rock. Once present, the gas moves through the ground and may enter structures through utility corridors, openings or cracks in foundations, and construction joints. Because radon gas is very dense, it may accumulate in basements or crawl spaces. Radon exposure has been linked to lung cancer. The USEPA action level for radon is above 4.0 picocuries per liter of air (pCi/l). The USEPA has mapped Los Angeles County as a Zone 2 radon area, which is defined as an area with a general indoor radon potential of between 2.0 and 4.0 pCi/l (USEPA 2019); thus, radon is not anticipated to be present at harmful concentrations in the geotech Affected Area.

No methane zones or methane buffer zones have been established south of the downtown Los Angeles area. As detailed in Section 4.10.2.5 in the Hazards and Hazardous Materials Section, oil and gas wells also exist in the geotech Affected Area of Alternative 3. Oil and gas wells have not been identified in the geotech Affected Area for Alternative 4, Design Options 1 and 2, or the Paramount and Bellflower MSF site options.

4.9.2.8 Mineral Resources

The geotech Affected Area is situated atop alluvial soils, some of which could likely be used as construction aggregate. However, considering the highly urbanized nature of the geotech Affected Area, mining of these materials is not economically viable. There are no viable mineral resources in the geotech Affected Area.

4.9.3 Environmental Consequences/Environmental Impacts

4.9.3.1 No Build Alternative

Under the No Build Alternative, regional and local projects would continue to be built. These projects would be designed and operated to established standards, and adherence to these criteria and standards would minimize geologic and geotechnical-related impacts and avoid adverse effects.

4.9.3.2 Build Alternatives—Common Impacts

The following subsection presents the environmental impacts and consequences that are common among Alternatives 1, 2, 3, and 4. Section 4.9.3.3 presents the environmental impacts and consequences that are alternative-specific.

Seismic Shaking and Fault-induced Ground Rupture

As discussed in Section 4.9.2.5, no known active faults capable of ground rupture are mapped within the geotech Affected Area, and the Project is not located in an Alquist-Priolo Earthquake Fault Zone, in accordance with Division of Mines and Geology Special Publication 42 (CGS 2016a through 2016e). The closest active faults capable of ground rupture near the geotech Affected Area are the Raymond Fault, approximately 4.5 miles north of the geotech Affected Area, and the Hollywood Fault, approximately 4.7 miles north of the geotech Affected Area. Considering that no known active faults capable of ground rupture are mapped in the geotech Affected Area, there is no potential for ground rupture from known active faulting for the Build Alternatives. However, there is the potential for co-seismic deformation (gentle folding of the ground surface) to occur in the geotech Affected Area for Alternatives 1 and 2 related to the Coyote Pass escarpment of the EPBT. The impacts of co-seismic deformation are discussed in Section 4.9.3.3.

Because the geotech Affected Area is within the seismically active region of Southern California, operation of the Build Alternatives could subject people and structures to moderate to strong seismic ground shaking, which could result in human injury or death, or damage to structures. Project Measure GEO PM-1 (Geotechnical Design [Operation]), described in Section 4.9.4.1, would include development of site-specific design parameters to account for the seismic ground shaking. The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, the distance from the source, and the site response characteristics. As indicated in Section 4.9.2.6, the conceptual PGA varies along the geotech Affected Area, ranging from 0.94g near the northern end (near US-101) to 0.72g near the southern end (near Pioneer Station) for the MDE. The estimated levels of ground shaking are integral parameters considered during the geotechnical and structural designs of the Project.

As mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation]), the Build Alternatives would be designed in accordance with the MRDC design standards (or equivalent), discussed in Section 4.9.1.1. Structures included with the Project would be

designed to perform in accordance with the MDE and ODE thresholds indicated in Section 4.9.1.1. As also described in Section 4.9.1.1, the design criteria (MRDC, Caltrans Seismic Design Criteria, or the LA County Building Code/CBC, or equivalent) dictate the average return period that would be used in the design. The average return period is directly correlated to the predicted intensity of shaking that a project would experience (the longer the return period, the greater intensity). Above-grade, at-grade, and below-grade structures would be designed and would perform in accordance with the thresholds for seismicity indicated in Section 4.9.1.1. By implementing the mandatory design requirements indicated in Section 4.9.1.1, structures included as part of the Project would be designed and constructed to withstand the estimated seismic ground shaking and resulting ground loads and deformations (per MRDC requirements, or equivalent). Under NEPA, impacts from the Build Alternatives would be minimized; adverse effects would be avoided; and no mitigation measures would be required.

Liquefaction/Seismically Induced Settlement

As discussed in Section 4.9.2.6 and shown on Figure 4.9-4, the alignments for Alternative 1, 2, and 3, from the Huntington Park area south, and all of the Alternative 4 alignment, are located in a Liquefaction Zone of Required Investigation. In addition, the Alternative 1 alignment, generally north of the Little Tokyo area, is also located in a Liquefaction Zone of Required Investigation. This means that these areas have historically experienced liquefaction or have conditions favorable for liquefaction. In addition, the alluvial soils above the groundwater table within the geotech Affected Area of Alternatives 1, 2, 3, and 4 are susceptible to seismically induced settlement. As such, operation of the Build Alternatives could subject people and structures to the effects of liquefaction or seismically induced settlement, which could result in human injury or death, or damage to structures.

Project Measure GEO PM-1 (Geotechnical Design [Operation]) requires that the Build Alternatives be designed in accordance with design standards, including standards specific to liquefaction and seismic settlement, such as the MRDC Section 5, Structural; Metro's Supplemental Seismic Design Criteria (2017g); and the California Seismic Hazards Mapping Act. These design standards (included in GEO PM-1) dictate that during final design, a geotechnical investigation would be conducted for the selected alternative. The investigation would also be in accordance with Metro's comprehensive geologic/geotechnical field investigation program that is currently being developed (Metro 2020c) and would include a detailed evaluation of these hazards. The design-level geotechnical investigations would provide information pertaining to the depths and areal extents of liquefaction and an estimate of the anticipated ground deformation associated with liquefaction, lateral spread, and seismically induced settlement.

During the design process, if it is determined that these hazards could result in an unacceptable soil or structural response (to be defined during final design, depending on the type of structure), the following ground improvements could be implemented consistent with the design standards provided in Section 4.9.1.1: dynamic compaction, stone columns, jet grouting, cement deep-soil mixing, and compaction grouting. Such ground improvements would reduce the potential for deformation to acceptable levels (to be determined during final design, depending on the type of structure). In lieu of ground improvements, structures and foundations would be designed to tolerate the estimated displacement. Structures included with the Project would be designed to perform in accordance with the MDE and ODE thresholds indicated in Section 4.9.1.1.

Project design plans would incorporate the design requirements mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation]) and described in Section 4.9.1.1. Under NEPA, by implementing these mandatory design requirements, impacts from the Build Alternatives would be minimized, adverse effects would be avoided, and mitigation would not be required.

Seismically Induced Inundation

Seismically induced inundation can occur when an earthquake causes catastrophic failure of a water-retaining structure, such as a reservoir, dam, or levee, and subsequent flooding occurs from the release of water from the structure. Based on review of state inundation maps, floodwaters resulting from dam inundation are not expected to affect tunnel portals or underground stations included with the Build Alternatives. The proposed portal and underground station locations are outside of the dam inundation areas identified by the California Dam Breach Inundation Maps produced by DWR (2019c). The portals and underground stations associated with Alternatives 1 and 2, including Design Options 1 and 2, are within the City of Los Angeles. According to the 2017 City of Los Angeles Local Hazard Mitigation Plan, the probability of dam failure is low in today's regulatory environment (City of Los Angeles 2017b). For the at-grade elements included in Alternatives 1, 2, 3, and 4, if seismically induced inundation occurred, the inundation would be short-lived and the water would be drained by the existing drainage system and future WSAB drainage improvements. For any of the Build Alternatives, modifications to local storm drain systems would be required to discharge runoff from the project alignment. New drainage pipes under at-grade track would collect stormwater to earthen or concrete drainage swales running parallel to the track, which would discharge to the existing local stormwater infrastructure. Drainage systems within the portions of elevated track and near tunnel portals would similarly collect and discharge stormwater. Therefore, under NEPA, impacts from the Build Alternatives would be minimized, adverse effects would be avoided, and mitigation would not be required.

Expansive Soils

As discussed in Section 4.9.2.7, clay-rich soils may exist locally within alluvial soils present in the geotech Affected Area. In addition, bedrock units can exhibit expansive properties because of the clay content within the bedrock; this includes the Fernando Formation bedrock present within the shallow subsurface in the downtown Los Angeles area. The placement of structures on expansive soil could result in structural distress. As such, operation of the above-grade and at-grade structures associated with the Build Alternatives could subject people and structures to the effects of expansive soils, which could result in damage to structures.

As part of Project Measure GEO PM-1 (Geotechnical Design [Operation]), the Build Alternatives would be designed and constructed in accordance with the recommendations to be included in the detailed geotechnical final design report. Expansive soil remediation could include soil removal and replacement, chemical treatment, or structural enhancements. Therefore, under NEPA, impacts from the Build Alternatives related to expansive soils would be minimized, adverse effects would be avoided, and mitigation would not be required.

Ground Settlement and Collapsible Soils

As discussed in Section 4.9.2.7, the alluvial soils along the geotech Affected Area for the Build Alternatives may be prone to collapse or settlement, which can result in differential

movement beneath foundations potentially causing distress to above-grade and at-grade structures. As such, operation of the above-grade and at-grade structures associated with the Build Alternatives could subject people and structures to the effects of ground settlement, which could result in damage to structures.

Detrimental ground settlement from new structures or earth loads is typically alleviated by removal and replacement of the settlement-prone or collapse-prone soils. Implementation of ground improvement methods (similar to those indicated for liquefaction) and structural support systems would also minimize the potential for impacts related to collapse or settlement.

As part of Project Measure GEO PM-1 (Geotechnical Design [Operation]), the Build Alternatives would be designed in accordance with the recommendations to be included in the detailed geotechnical advance design report. Recommendations specific to detrimental ground settlement from new structures or earth loads would be provided, based on site-specific geotechnical investigation. Therefore, under NEPA, impacts from the Build Alternatives related to settlement-prone or collapse-prone soils would be minimized; adverse effects would be avoided; and mitigation would not be required.

Naturally Occurring Oil and Gas

As discussed in Section 4.19.3.9, Construction Impacts, foundation excavations for viaducts or other support structures may encounter hazardous gases resulting in a construction hazard. Viaducts and other support structures would be included as part of Alternatives 1, 2, 3, or 4. Subterranean structures are not included as part of Alternatives 3 and 4, and there are no oil or gas fields in their respective geotech Affected Areas. Therefore, under NEPA, naturally occurring oil and gas hazards are not anticipated to be a concern during operation of Alternatives 3 and 4, or the at- or above-grade portions of Alternatives 1 and 2; there would be no adverse effects; and mitigation would not be required.

See Sections 4.9.3.3 and 4.19.3.9 regarding the naturally occurring oil and gas hazard as applicable to the operation and construction, respectively, of Alternatives 1 and 2.

4.9.3.3 Build Alternative Specific Impacts

The following subsections present the environmental impacts and consequences that are not common to all Build Alternatives.

Co-seismic Deformation

The Coyote Pass escarpment transects the downtown Los Angeles area (including the Alternative 1 and 2 alignments) in the subsurface. The Coyote Pass escarpment is a feature created by co-seismic deformation related to movement of the Upper EPBT. This deformation (gentle folding) could result in damage to aerial structures, tunnels, subterranean stations, or at-grade stations included as part of Alternatives 1 and 2. The Coyote Pass escarpment trends roughly east-west and transects the alignments of Design Options 1 and 2 of Alternative 1, and the northwestern portion of Alternative 2. The Coyote Pass escarpment does not cross the Alternative 3 or 4 alignments.

Based on the available data, the Coyote Pass escarpment likely crosses North Alameda Street between Temple Street on the north and 4th Street on the south. The location of the escarpment in the geotech Affected Area was projected from this area at North Alameda Street to the west,

where topographic expression of the feature is evident near SR-110. Based on this projection, the Coyote Pass escarpment continues westerly from North Alameda Street to an approximate location between 4th Street (on the north) and 9th Street (on the south) along Flower Street.

Operation of the stations, tunnels, and other design features associated with Alternatives 1 and 2 could subject people and structures to the effects of co-seismic deformation, which could result in human injury or death, or damage to structures.

As part of Project Measure GEO PM-1 (Geotechnical Design [Operation]), the design of either Alternative 1 or 2 would consider the effects of EPBT and associated uplift of the Coyote Pass escarpment in general accordance with MRDC Section 5, Revision 12 (dated November 20, 2017), page 5A-35. The MRDC state that "for blind thrust faults in the vicinity of underground structures, it may be necessary to estimate surface uplift, as in the case of the Eastside Coyote Escarpment." There is a potential for ground deformation to occur from the folding of the Coyote Hills escarpment, which, if it extended beneath an underground station or tunnel, could have an impact on the station's structure and tunnel lining. Ground conditions would be verified during the final design phase if Alternative 1 or 2 is the selected alternative, and the stations' structures and tunnel lining would be designed to accommodate the estimated deformation along the escarpment, where needed.

The two-level seismic design approach (based on the MDE and ODE requirements of the MRDC) would be used to estimate the amount of deformation to be assumed during final design. As described in Section 4.9.1.1, the design approach (MRDC, Caltrans Seismic Design Criteria, or the LA County Building Code/CBC, or equivalent) dictates the average return period that would be used in the design. The average return period is directly correlated to the amount of deformation to be assumed in the design of structures that cross the escarpment (the longer the return period, the greater the amount of deformation). Above-grade, at-grade, and below-grade structures would perform in accordance with the MDE and ODE thresholds indicated in Section 4.9.1.1.

Therefore, as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation]), Alternatives 1 and 2 would be designed, constructed, and operated according to the analysis described above and the design standards provided in Section 4.9.1.1. Therefore, under NEPA, the potential for co-seismic deformation impacts from Alternatives 1 and 2 would be minimized consistent with established standards; no adverse effects would occur and mitigation would not be required.

Naturally Occurring Subsurface Gas

Naturally occurring methane vapor and H_2S gases could impact the operation of tunnels and stations within Alternative 1 (including Design Options 1 and 2) and Alternative 2. Alternatives 3 and 4 do not include tunnels or underground stations and there are no oil or gas fields in their respective geotech Affected Areas. Therefore, naturally occurring oil and gas hazards are not anticipated to be a concern during operation of Alternatives 3 and 4.

If subsurface gases were to accumulate within the Alternative 1 (including Design Options 1 and 2) and Alternative 2 tunnels or stations, this would pose a potential fire/explosion hazard during operation. Additionally, accumulation of methane gas could replace oxygen in the breathing zone, and accumulation of H_2S would be highly toxic when inhaled at high concentrations, thus creating a health hazard during operation. Metro has extensively studied methane and H_2S characteristics with respect to its effects on the operation of its rail facilities

within Los Angeles County, as methane and H_2S are present in the ground surrounding the following projects: existing Metro B (Red) Line; existing and planned Metro D (Purple) Line; and the underground portion of the Metro L (Gold) Line Eastside Extension. For over 35 years, Metro has been developing documentation and methods for reducing or eliminating hazardous conditions for its facilities that are under construction or already in operation. This documentation includes the following:

- Alerting Report on Tunneling Liners, Metro 1984—Tunnel construction methods, lining methods, and ventilation requirements for the then proposed 1983 alignment of the Metro B (Red) Line tunnels (along Wilshire Boulevard and Fairfax Avenue)
- Congressionally Ordered Reengineering Study, Metro, 1985—Established methane conditions along alternative alignments and led to the realignment of the then proposed Metro B (Red) Line into its current alignment

Additionally, Metro designed a procedure for a "two-pass" tunnel lining system (i.e., two tunnel linings that are constructed in sequence, with the second lining being constructed within the first lining). This approach includes a high-density polyethylene water and gas barrier within the tunnel construction.

Metro also prepared a study to locate and monitor gas-bearing geologic formations for the Mid-City area. This study determined the extent of the gas reservoirs, examined methods of treatment for pre-tunneling and tunneling timeframes, and recommended tunnel and station configurations to avoid the most gaseous areas. In addition, Metro implemented a double-gasketed tunnel liner that can flex enough to protect rail tunnels from gas intrusion before, during, and after an earthquake. Along with this system, Metro continuously monitors for gaseous environments in its tunnels and has emergency ventilation in all its tunnel facilities in addition to the standard tunnel ventilation.

As described previously, because Alternative 1 passes through an area characterized by an abandoned oil field (Union Station Oil Field)/methane zones and Alternative 2 is located adjacent to an oil field (Los Angeles Oil Field) and is within a methane zone, gaseous conditions may be encountered in both Alternatives 1 and 2. Metro has specified design measures to address the gassy environments, which include the following:

- Construct subterranean walls with waterproof and vapor-proof membranes to fulfill requirements of the City of Los Angeles methane regulations, as enforced by the LADBS
- Design tunnels and stations to provide a redundant protection system against gas intrusion hazards, such as those described in the City of Los Angeles Municipal Code, Chapter IX, Building Regulations, Article 1, Division 71, Methane Seepage Regulations

Additionally, as the project proceeds through the development process, comprehensive geologic, geotechnical, and environmental investigations would be conducted and design-level documents would be prepared for the selected alternative. These design-level reports would verify and document the hazardous subsurface conditions in the project area and support the design recommendations in compliance with the applicable regulations and standards for hazardous substances, geologic, and geotechnical conditions and hazards.

In compliance with these regulations, specific requirements for the Project would be determined according to the actual methane levels and pressures observed onsite. The identified specific requirements would then be incorporated into the design of the Project.

Further factors that would reduce the risk of gas exposure and intrusion into the project structures during operation are as follows:

- Gases would be purged from the tunnels simply by the air movement caused by the action of trains running through the tunnels.
- During non-revenue operations, air velocity would be maintained at a minimum of 100 feet per minute, per Metro's Design Criteria. This air velocity is the minimum that the ventilation system must achieve to direct gases toward the nearest point of extraction and prevent hazardous gases from accumulating during the hours when the trains are not operating. Additional ventilation is also employed during revenue operations.

In addition, gas and waterproofing systems would be included in the design of the tunnels. In accordance with Project Measure GEO PM-2 (Oil and Gas Zones [Operation]), described in Section 4.9.4.1, the design would be specific to methane levels and pressures measured along the geotech Affected Area. Many of the following systems are currently being used for the Metro D (Purple) Line extension (Metro 2017g) and would be considered, as needed, for Alternative 1 or 2:

- Specially designed precast concrete liners used for the primary tunnel lining for ground support and water and gas barrier would be designed with the possibility of adding a secondary liner as needed if leakage occurs at some future time.
- Lining may include thicker segments to protect against corrosion and wider gaskets may be used to increase the performance of the gasket seals.
- Reduced permeability tunnel segment concrete—the segments may include steel fibers or other types of fiber reinforcement for denser concrete as well as coatings.
- Double-gasket design to provide a second seal for a more redundant system. This also facilitates post-installation repair of leaks (if needed) by grouting the areas between the gaskets.
- Segment Insert Materials—use of non-corrosive plastics, for example plastic dowels, at segment circumferential joints.
- Rapid repair methods, such as preinstalled grout tubes within waterproofing systems.
- Compartmentalized water and gas-proofing membranes would be used in station structures so that leakage, if it occurs, can be isolated and readily repaired using preinstalled grout tubes.
- Other methods for gas and waterproofing may also be added if identified during the advancement of design.

Because the planned tunnels in Alternatives 1 and 2 would be ventilated spaces with vapor barriers preventing communication of gases between the interior and exterior of the tunnel, the presence of the tunnel would not influence the gases already present within the ground. Considering the above-described design enhancements that would be implemented, and that the tunnel is relatively small when compared with the underground gassy area, the tunnel would not change long-term flow patterns of water and gas in the subsurface. Tunnels also would not provide new pathways for gas transmission, as the tunnel construction methodology would use grout along its length such that the space around the tunnel would be sealed by the grout. The final presence of the constructed tunnel would then have no impact on the long-term migration of gases to the ground surface during operation.

Hazardous subsurface gases are likely present in the vicinity of the Build Alternative tunnels. Accumulation of hazardous surface gases within these tunnels during operation would pose a risk of fire/explosion and a health risk from toxic gas exposure. Project Measure GEO PM-2 (Oil and Gas Zones [Operation]) would be implemented to identify, reduce, and minimize potential impacts to operators and the public during operation. However, due to the broad-spectrum nature of the project design features included as part of Alternatives 1 and 2, under NEPA, the adverse effects would be minimized but would not be completely eliminated. Therefore, Mitigation Measures GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel), described in Section 4.9.4.2, would be implemented to further reduce these adverse effects during operation. With implementation of these measures for Alternatives 1 and 2, no adverse effects related to potential hazardous subsurface gases would occur during operation.

4.9.3.4 Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The evaluation for the Alternative 1 design options considered seismic shaking and ground rupture, liquefaction/seismically induced settlement, seismically induced inundation, co-seismic deformation, expansive soils, ground settlement and collapsible soils, and naturally occurring oil and gas. The design options and Alternative 1 have substantially similar geologic settings and potential geotechnical operational impacts and effect determinations. The conclusions provided for Alternative 1 in Sections 4.9.3.2 and 4.9.3.3 are also applicable to the design options. Under NEPA, with implementation of the measures indicated in Sections 4.9.3.2 and 4.9.3.3, no adverse effects would occur during operation of either Design Option 1 or 2.

4.9.3.5 Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: In addition to train storage tracks, which are similar to those included as part of the Build Alternatives, the selected MSF would include a number of building structures. As with the Build Alternatives, the MSF would be subject to the prescribed standards, requirements, and guidance related to the design of the proposed building structures, including the requirements of the CBC, or equivalent. The MSF site options and Alternative 4 have substantially similar geologic settings and potential geotechnical operational impacts and effect determinations. The risks and effects related to seismic shaking and ground rupture, liquefaction/seismically induced settlement and inundation, expansive soils, ground settlement, and collapsible soils at the MSF sites would be substantially similar to those effects identified for Alternative 4.

As part of Project Measure GEO PM-1 (Geotechnical Design [Operation]), the Build Alternatives, including the MSF site options, would be designed in accordance with the recommendations to be included in the detailed geotechnical design report. Recommendations addressing seismic shaking and ground rupture, liquefaction/seismically induced settlement and inundation, expansive soils, ground settlement, and collapsible soils would be provided, based on site-specific geotechnical investigation. Therefore, under NEPA, the Paramount or Bellflower MSF site option impacts related to these hazards would be minimized; adverse effects would be avoided; and mitigation would not be required.

4.9.4 Project Measures and Mitigation Measures

As discussed in Section 4.9.3.2 and 4.9.3.3, potential impacts associated with the design and operation of the Build Alternatives, design options, and MSF sites would be minimized

through compliance with established design standards discussed in Section 4.9.1 and implemented through Project Measures GEO PM-1 (Geotechnical Design [Operation]) and GEO PM-2 (Oil and Gas Zones [Operation]) and Mitigation Measures GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation]), and GEO-4 (Tunnel Advisory Panel). Project Measure GEO PM-1 is applicable to all of the Build Alternatives, design options, and MSF site options. Project Measure GEO PM-2 and Mitigation Measures GEO-1 through GEO-4 are specific to Build Alternatives 1 and 2.

4.9.4.1 Project Measures

Metro would verify that the following project measures (which were developed in accordance with the design requirements summarized in Section 4.9.1) are implemented to reduce geologic-, soil-, and seismicity-related impacts. These project measures are required and are considered part of the Project:

GEO PM-1: Geotechnical Design (Operation)

A number of geotechnical design reports are required for the Project, as detailed in the MRDC, Section 5.6, Geotechnical Investigations, Analysis and Design. Section 5.6 of the MRDC provides detailed requirements for planning and conducting a geotechnical investigation, geotechnical design methodologies, and reporting. In addition, and as referenced in the MRDC, Caltrans and the County of Los Angeles Building Code have their own design requirements for bridges and aerial structures (Caltrans) and building structures (County of Los Angeles) that are also required.

In accordance with the MRDC, geotechnical report recommendations would be incorporated into the project plans and specifications. These recommendations would be a product of final design and would address the subsurface hazards identified in this report. Without these report recommendations, the project plans and specifications would not be approved, and the Project would not be allowed to advance into the final design stage or ultimately into construction. As a part of the WSAB conceptual engineering phase, Metro has developed a comprehensive geotechnical field investigation and laboratory testing program (Metro 2020c) and is in the process of implementing the program. Findings from that program would be used to verify the information presented in the Final EIS/EIR.

GEO PM-2: Oil and Gas Zones (Operation)

The primary protection for hazardous gases during system operations would be provided by physical barriers, which may include gasketed tunnel liner systems and gas-proofing membranes. Tunnels, stations, and appurtenant facilities would be designed in accordance with the City of Los Angeles Municipal Code, Chapter IX, Building Regulations, Article 1, Division 71, Methane Seepage Regulations, as amended by the City of Los Angeles Methane Ordinance (No. 175790). Design requirements would be specific to verified methane levels and pressures measured along the geotech Affected Area and would be incorporated into the design and construction. The requirements would include constructing subterranean walls with waterproof and vapor-proof membranes and designing the tunnels and stations to provide a redundant protection system against gas intrusion hazards.

Gases would be purged from the tunnels simply by the air movement caused by the action of trains running through the tunnels. During non-revenue operations, air velocity would be maintained mechanically at a minimum of 100 feet per minute, per Metro's Design Criteria. This air velocity is the minimum that the ventilation system must achieve to direct gases

toward the nearest point of extraction and prevent hazardous gases from accumulating during the hours when trains are not operating. Additional mechanical ventilation would also be employed during revenue operations.

Metro has extensively studied methane and H_2S impacts on tunnel projects throughout Los Angeles and has developed methods for reducing or eliminating hazardous conditions in its facilities while in operation (Metro 2017g). Prior to construction, Metro would require contractors to complete an assessment for methane and H_2S in accordance with LADBS *Site Testing Standards for Methane* (LADBS 2014) guidelines where the geotech Affected Area passes through oil fields, methane zones, and/or methane buffer zones. The assessment would determine where hazardous gases are present and at what quantities. In areas where elevated gases are detected, soil gas probes would be installed to monitor for methane, H_2S, oxygen, and carbon dioxide before, during, and after tunneling.

4.9.4.2 Mitigation Measures

GEO-1 Hazardous Gas (Operation)

Metro would install gas monitoring and detection systems with alarms, as well as ventilation equipment to dissipate gas to safe levels according to Metro's current design criteria for operation, as included as part of Mitigation Measure GEO-2 (Structural Design). Measures to monitor and control hazardous subsurface gas would include, but are not limited to, the following for both tunnel and station operation:

- High-volume ventilation systems with back-up power sources
- Gas detection systems with alarms
- Emergency ventilation triggered by the gas detection systems
- Automatic equipment shut-off
- Maintenance and operations personnel training
- Gas detection instrumentation set to send alarms to activate ventilation systems and evacuate structures as follows: methane gas—minor alarm at 10 percent of the lower explosive limit (LEL) (activate ventilation) and major alarm at 20 percent of the LEL (evacuation of area)
- H_2S —Minor alarm at 8 ppm and major alarm at 10 ppm

GEO-2 Structural Design

Protection from hazardous gases during project operation is provided by physical barriers, including tunnel liner membranes and station liner membranes, that reduce gas from migrating into an occupied space. The acceptable levels of gas migration during operation are based on OSHA and MRDC requirements, or equivalents.

Designs to reduce gas and groundwater intrusion in tunnels would also be used where appropriate, including:

- Additional barriers
- Compartmentalized barriers to facilitate leak sealing
- Flexible sealants, such as poly-rubber gels, along with high-density polyethylene-type materials
- Secondary station walls to provide additional barriers
- Active ventilation systems

The evaluations for station and tunnel construction materials would include laboratory testing during development of the system and material selection. The testing programs would review:

- Segment leakage: Pressurized gasket seal testing before, during, and after seismic movements, including various gasket materials and varying gasket profiles.
- Gasket material properties: Effective product life testing and resistance testing to deterioration when subjected to man-made and natural contaminants, including methane/H_2S gases, asphaltic materials, and other typical and potentially damaging construction materials.
- Various high-density polyethylene products, including poly-rubber gels currently used in ground containing methane in other cities, would be considered and tested/utilized as appropriate/needed.

Alternative methods for field testing of high-density polyethylene joints would be examined to provide additional quality control during installation.

Metro's gas-proofing leakage criteria mandate that all underground structures be designed to prevent the ingress from the ground of soil, water, hydrocarbons, and gas with no dripping water or visible signs of hydrocarbons. During operation of underground structures, no detectable methane or H_2S gas above 2.5 percent of the LEL for methane or 1.5 ppm for H_2S shall be detectable at an air velocity of 60 feet/min.

GEO-3 Gas Monitoring (Operation)

In accordance with MRDC requirements or equivalent, during operation of the Project, monitoring and recording of hazardous gas levels would be required to protect the public in areas of known or suspected gassy soil conditions. The hazardous gas levels in the operating environment would be continuously monitored and recorded. During operation, if gas levels increase (trigger levels are included as part of Mitigation Measure GEO-1 [Hazardous Gas [Operation]] and GEO-2 [Structural Design]) and pose risk to life, alarms would be triggered and the area would be evacuated immediately. After evacuation, procedures would be in place instructing personnel on how to safely proceed if elevated levels are detected.

GEO-4 Tunnel Advisory Panel

As was done for other recent Metro projects, the Metro TAP will review designs with respect to subsurface gas hazards in the areas of identified higher risk: (i.e., the Alternative 1 and Alternative 2 tunnel and station areas within mapped methane zones and methane buffer zones). The advisory panel consists of highly qualified tunnel design experts who will provide guidance on hazardous gases, gas intrusion, and ground contaminant effects on underground structures.

4.9.5 California Environmental Quality Act Determination

To satisfy CEQA requirements, geology and soils operational impacts have been analyzed in accordance with Appendix G of the *CEQA Guidelines*. The CEQA determinations presented below are based on the existing conditions described in Section 4.9.2 of this Draft EIS/EIR and the environmental impacts analysis presented in Section 4.9.3.

CEQA is only concerned with the effects of a project on the environment, not the effects of the environment on the Project (California Building Industry Association v. Bay Area Air

Quality Management District [2015] 62 Cal. 4th 369). For informational purposes, however, the following subsections analyze the potential impacts of developing the Project within the seismically active region of Southern California. The following analysis also considers whether the Project might exacerbate geological, seismic, and related hazards (see state CEQA Guidelines, CCR Title 14 §15126.2(a)). The analysis is based on the questions presented in Appendix G of the *CEQA Guidelines*.

The CEQA determinations for naturally occurring gases as they relate to the operation and construction of the project alternatives, including environmental and health impacts, are discussed in Hazardous Materials Sections 4.10.5 and 4.19.10, respectively.

4.9.5.1 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

No Project Alternative

Under the No Project Alternative, the geotech Affected Area would remain unchanged. There would be no impact to the geology (including faulting) and soils in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and no mitigation measures would be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternatives 1 and 2 could experience impacts associated with a known earthquake fault. The geotech Affected Area is not located within an Earthquake Fault Zone established by the State of California Alquist-Priolo Earthquake Fault Zoning Act (CGS Special Publication 42). However, Alternatives 1 and 2 could experience significant impacts associated with co-seismic deformation along the Coyote Pass escarpment.

As indicated in Section 4.9.3.3 and as mandated by Project Measure GEO PM -1 (Geotechnical Design [Operation] [Section 4.9.4.1]), the Project would be designed to accommodate the anticipated levels of ground deformation associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds discussed in Section 4.9.1. As such, operation of Alternatives 1 and 2 would not result in potentially significant impacts, including the risk of loss, injury, or death, from rupture of a known earthquake fault. Therefore, impacts related to rupture along a known earthquake fault and co-seismic deformation would be less than significant with design and construction performed per applicable design criteria. Mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Alternative 3 is not underlain by a known active fault capable of ground rupture and is not located within an Earthquake Fault Zone established by the State of California Alquist-Priolo Earthquake Fault Zoning Act (CGS Special Publication 42). As such, operation of Alternative 3 would not result in potentially significant impacts, including the risk of loss, injury, or death, from ground rupture of a known earthquake fault. There would be no impacts related to ground rupture along a known active earthquake fault, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

As with Alternative 3, Alternative 4 is not underlain by a known active fault capable of ground rupture and is not located within an Earthquake Fault Zone. As such, operation of Alternative 4 would not result in potentially significant impacts, including the risk of loss, injury, or death, from ground rupture of a known earthquake fault. There would be no impacts related to ground rupture along a known active earthquake fault, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: MWD and Design Option 2: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar, and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Impacts related to rupture along a known earthquake fault and co-seismic deformation would be less than significant with design and construction performed per the applicable design criteria mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]). Mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Paramount and Bellflower MSF site option locations and proposed improvements are substantially similar, and the determination provided above for Alternative 4 is applicable to either MSF site. There would be no impacts, and no mitigation measures would be required.

4.9.5.2 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

No Project Alternative

Under the No Project Alternative, there would be no impact related to strong seismic ground shaking in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and no mitigation measures would be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

As discussed in Section 4.9.3.2, Alternatives 1 and 2 could be exposed to strong seismic ground shaking. However, as discussed in Section 4.9.1, and as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), Alternatives 1 and 2 would be designed to accommodate the anticipated levels of ground shaking associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds.

The potential to experience substantial seismic ground shaking is a common hazard for every project in Southern California, and the hazard cannot be avoided. Structures (aerial, at-grade, and underground) have been and continue to be successfully designed and constructed based on mandatory design criteria. Experience in California and worldwide shows that bored tunnels generally perform well during earthquake ground shaking, typically suffering less damage than surface structures. Because they are embedded in the ground, they move with the ground, and thus their motion is not magnified by the pendulum effect that occurs when an aboveground structure is shaken by an earthquake (Hashash et al. 2001). Considering the

seismic design requirements mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation]), operation of Alternatives 1 and 2 would not result in substantial adverse effects, including the risk of loss, injury, or death, related to seismic shaking.

Operation of Alternatives 1 and 2 would not have an adverse effect on the geologic environment. The design features being considered are not uncommon for the Los Angeles region and would not exacerbate existing geologic conditions related to seismic shaking. Therefore, impacts related to seismic shaking would be less than significant with design and construction performed in accordance with applicable design criteria, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Alternative 3 would incorporate the same structures as Alternatives 1 and 2, with the exception of underground structures. Alternative 3 would have the same potential for exposure to strong seismic ground shaking as Alternatives 1 and 2. However, as discussed in Section 4.9.1, and as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), Alternative 3 would be designed to accommodate the anticipated levels of ground shaking associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds.

Therefore, impacts related to seismic shaking would be less than significant with design and construction performed in accordance with applicable design criteria, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Alternative 4 would incorporate the same structures as Alternative 3. Alternative 4 would have the same potential for exposure to strong seismic ground shaking as Alternatives 1, 2, and 3. However, as discussed in Section 4.9.1, and as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), Alternative 4 would be designed to accommodate the anticipated levels of ground shaking associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds.

Therefore, impacts related to seismic shaking would be less than significant with design and construction performed in accordance with applicable design criteria, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar, and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Impacts related to seismic shaking would be less than significant with design and construction performed per applicable design criteria as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Paramount and Bellflower MSF site option locations and proposed improvements are substantially similar, and the determination

provided above for Alternative 4 is applicable to either MSF site. Impacts related to seismic shaking would be less than significant with design and construction performed per applicable design criteria as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), and mitigation would not be required.

4.9.5.3 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving Seismic-related ground failure, including liquefaction?

No Project Alternative

Under the No Project Alternative, there would be no impact to the geology and soils (including seismic-related ground failure and liquefaction potential) in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and no mitigation measures would be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

As discussed in Section 4.9.3.2, Alternatives 1 and 2 could be exposed to seismic-related ground failure, including liquefaction, lateral spreading, and seismically induced settlement. However, as discussed in Section 4.9.1, and as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), Alternatives 1 and 2 would be designed to accommodate the anticipated levels of deformation associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds discussed in Section 4.9.1.

The seismic-related ground failure hazard is a well-known hazard in Southern California and structures (aerial, at-grade, and underground) have been and continue to be successfully designed and constructed based on the referenced mandatory design criteria. Where warranted by site-specific subsurface conditions identified during the final design stage, design enhancements (e.g., ground improvements or structural enhancements) can reduce potentially significant impacts to levels within the acceptable limits for the structure (to be determined during final design). Considering the seismic design requirements mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation]), operation of Alternatives 1 and 2 would not result in substantial adverse effects, including the risk of loss, injury, or death related to seismic-related ground failure, including liquefaction. Operation of Alternatives 1 and 2 would not have an adverse effect on the geologic environment. The design features being considered are not uncommon for the Los Angeles region and would not exacerbate existing geologic conditions related to seismic-related ground failure. Therefore, impacts would be less than significant with design and construction performed in accordance with applicable design criteria, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Alternative 3 would have the same potential exposure to seismic-related ground failure, including liquefaction, lateral spreading, and seismically induced settlement, as Alternatives 1 and 2. Similar to Alternatives 1 and 2, Alternative 3 would be designed to accommodate the anticipated levels of deformation associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds. Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]) would apply to this alternative.

Therefore, impacts would be less than significant with design and construction performed in accordance with applicable design criteria, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Alternative 4 would have the same potential exposure to seismic-related ground failure, including liquefaction, lateral spreading, and seismically induced settlement, as with Alternatives 1, 2, and 3. Similar to Alternatives 1, 2, and 3, Alternative 4 would be designed to accommodate the anticipated levels of deformation associated with a design seismic event, and structures would perform in accordance with the MRDC MDE and ODE thresholds. Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]) would apply to this alternative. Therefore, impacts would be less than significant with design and construction performed in accordance with applicable design criteria, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Impacts related to seismic-related ground failure would be less than significant with design and operation performed per applicable design criteria as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Bellflower and Paramount MSF site option locations and proposed improvements are substantially similar, and the determination provided above for Alternative 4 is applicable to either MSF site. Impacts related to seismic-related ground failure would be less than significant with design and operation performed per applicable design criteria as mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation]) [Section 4.9.4.1]), and no mitigation measures would be required.

4.9.5.4 Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

No Project Alternative

Under the No Project Alternative, there would be no impact to the geology (including landslides) and soils in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

The landscape within the geotech Affected Area for Alternatives 1 and 2 is relatively flat, and no landslides have been mapped in the vicinity of the geotech Affected Areas. Natural landslides are not considered a hazard to the Project. Operation of Alternatives 1 and 2 would not have a potentially significant impact on the geologic environment. The design features being considered are not uncommon for the Los Angeles region and would not exacerbate existing geologic conditions. Therefore, impacts would be less than significant, and mitigation would not be required. Temporary excavations, which could introduce the potential for

construction-related landslides, are discussed in Section 4.19.3.9 (Geology and Soils Construction Impacts).

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

The landscape within the geotech Affected Area for Alternative 3 is the same as Alternatives 1 and 2, and operation of Alternative 3 would not have a potentially significant impact on the geologic environment. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

The landscape within the geotech Affected Area for Alternative 4 is the same as Alternatives 1, 2, and 3, and operation of Alternative 4 would not have a potentially significant impact on the geologic environment. Therefore, impacts would be less than significant, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The Design Options 1 and 2 locations and proposed improvements are substantially similar, and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Therefore, impacts would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Paramount and Bellflower MSF site option locations and proposed improvements are substantially similar, and the determination provided above for Alternative 4 is applicable to either MSF site. Therefore, impacts would be less than significant, and mitigation would not be required.

4.9.5.5 Result in substantial soil erosion or the loss of topsoil?

No Project Alternative

Under the No Project Alternative, there would be no impact to the geology and soils (including loss and erosion) in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternatives 1 and 2 are located in an urban setting and the topsoil layer in most of the geotech Affected Area has been disturbed or concealed by previous human activities. The potential impacts would involve the loss of topsoil as an agricultural resource and loss of an erosional barrier. Post-construction operation of the Project would not result in ground-surface disturbance, site clearance, excavation, or grading that would otherwise create the potential for soil erosion to occur. Alternatives 1 and 2 would operate on designed and constructed facilities implemented in accordance with state and local guidelines regarding erosion. Additionally, a required Stormwater Pollution Prevention Plan and Water Quality Control Plan would be in place as part of operation, among other regulatory requirements, as detailed in Section 4.11.1.1 in the Water Resources Section.

The geotech Affected Area is not used for agricultural purposes and the topsoil layer has already been disturbed or concealed by previous human activities. Considering the design requirements associated with erosion and mandatory best management practices detailed in Section 4.11.1.1 in the Water Resources Section, operation of Alternatives 1 and 2 would not result in substantial soil erosion or loss of topsoil. Therefore, impacts would be less than significant with design and construction performed per applicable design criteria, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

As with Alternatives 1 and 2, Alternative 3 is located in an urban setting and the topsoil layer in most of the geotech Affected Area has been disturbed or concealed by previous human activities. Alternative 3 would have the same potential impacts as Alternatives 1 and 2. Considering the design requirements associated with erosion and mandatory best management practices detailed in Section 4.11.1.1 in the Water Resources Section, operation of Alternative 3 would not result in substantial soil erosion or loss of topsoil. Therefore, impacts would be less than significant with design and construction performed per applicable design criteria, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

As with Alternatives 1, 2, and 3, Alternative 4 is located in an urban setting and the topsoil layer in most of the geotech Affected Area has been disturbed or concealed by previous human activities. Alternative 4 would have the same potential impacts as Alternatives 1, 2, and 3. The potential impacts would involve the loss of topsoil as an agricultural resource and loss of an erosional barrier.

Considering the design requirements associated with erosion and mandatory best management practices detailed in Section 4.11.1.1 in the Water Resources Section, operation of Alternative 4 would not result in substantial soil erosion or loss of topsoil. Therefore, impacts would be less than significant with design and construction performed per applicable design criteria, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Design Option 1 or 2 would not result in substantial soil erosion or loss of topsoil and impacts would be less than significant with design and operation performed per applicable design criteria, including those identified in Section 4.11.1.1 in the Water Resources Section, and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Paramount and Bellflower MSF site option locations and proposed improvements are substantially similar, and the determination provided above for Alternative 4 is applicable to either MSF site. Impacts related to substantial soil erosion or loss of topsoil would be less than significant with design and operation performed per applicable design criteria, including those identified in Section 4.11.1.1 in the Water Resources Section, and mitigation would not be required.

4.9.5.6 Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

No Project Alternative

Under the No Project Alternative, there would be no impact to the geology and soils that would affect the potential for these hazards in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

Operational analysis and impact determinations for Alternatives 1 and 2 related to liquefaction, lateral spreading, and landslides are provided in Section 4.9.3.2. See Section 4.9.5.3 regarding the CEQA determination for ground failure (including liquefaction and lateral spreading), and Section 4.9.5.4 for the landslide hazard determination.

The geotech Affected Area for Alternatives 1 and 2 may be prone to collapse or settlement, which can result in differential movement beneath foundations potentially causing distress to above-grade and at-grade structures. As such, operation of the above- and at-grade structures associated with Alternatives 1 and 2 could subject people and structures to the effects of ground settlement, which could result in damage to structures.

Detrimental ground settlement from new structures or earth loads is typically alleviated by removal and replacement of the settlement/collapse-prone soils. Additionally, implementation of ground improvement methods (similar to those indicated for liquefaction) and structural support systems would minimize the potential for impacts related to collapse or settlement. As part of Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), Alternatives 1 and 2 would be designed in accordance with the mandatory design requirements of the MRDC or equivalent, including design criteria identified in the design reports from site-specific geotechnical investigations. The recommendations that would be provided with those requirements and considered in the final design stage of the Project would specifically address detrimental ground settlement from new structures or earth loads. Based on the analysis presented above, operation of Alternatives 1 and 2 would not result in potentially significant impacts related to the risk of settlement or collapsible soil. Therefore, impacts related to settlement or collapsible soil would be less than significant with design and construction performed per applicable design criteria, and no mitigation measures would be required.

Regional subsidence results from the withdrawal of groundwater and/or hydrocarbons from the subsurface. DWR (2014) estimated the potential for future land subsidence within the geotech Affected Area to be low because groundwater withdrawal is restricted and managed, and, where performed, it is compensated for by reinjection of water in volumes similar to what is withdrawn. Potential impacts related to regional subsidence would be a less than significant hazard to the Project, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Operational analysis and impact determinations for Alternative 3 related to liquefaction, lateral spreading, and landslides are similar to Alternatives 1 and 2. Therefore, the impact conclusion for Alternatives 1 and 2 are applicable to Alternative 3. Potential impacts related to

regional subsidence would be a less than significant hazard to the Project, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Operational analysis and impact determinations for Alternative 4 related to liquefaction, lateral spreading, and landslides are similar to Alternatives 1, 2, and 3. Therefore, the impact conclusion for Alternatives 1, 2, and 3 are applicable to Alternative 3. Potential impacts related to regional subsidence would be a less than significant hazard to the Project, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 1: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar, and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Impacts related to collapse, settlement, and subsidence would be less than significant with design and operation performed per applicable design criteria mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Paramount and Bellflower MSF site option locations and proposed improvements are substantially similar, and the determination provided above for Alternative 4 is applicable to either MSF site. Impacts related to collapse, settlement, and subsidence would be less than significant with design and operation performed per applicable design criteria mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1), and mitigation would not be required.

4.9.5.7 Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No Project Alternative

Under the No Project Alternative, there would be no impact to the geology and soils (including expansive soil potential) in the geotech Affected Area. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

As discussed in Section 4.9.3.2, clay-rich soils may exist locally within alluvial soils present in the geotech Affected Area. In addition, bedrock units also can exhibit expansive properties due to the clay content within the bedrock; this includes the Fernando Formation bedrock present within the shallow subsurface of the northern portion of Alternative 1 and the northwestern portion of Alternative 2. The placement of structures on expansive soil could result in structural distress. Therefore, operation of the at-grade, above-grade, and below-grade structures associated with Alternatives 1 and 2 would potentially subject people and structures to the effects of expansive soils, which could result in damage to structures.

As mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), structures to be constructed as part of Alternatives 1 and 2 would be designed and constructed in accordance with MRDC and CBC standards (the UBC is no longer applicable)

or equivalent (see Section 4.9.1) specific to expansive soils. These required design standards would yield structures that would tolerate the effects of expansive soil, or the expansive soils would be remediated. Expansive soil remediation could include soil removal and replacement, chemical treatment, or structural enhancements.

As part of Project Measure GEO PM-1 (Geotechnical Design [Operation]), Alternatives 1 and 2 would be designed in accordance with the recommendations to be included in the detailed geotechnical design reports. Considering the mandatory design requirements associated with expansive soils, operation of Alternatives 1 and 2 would not result in significant impacts, including the risk of loss, injury, or death related to expansive soils. Therefore, impacts related to expansive soils would be less than significant with design and construction performed per applicable design criteria, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Operation of the at-grade and above-grade structures associated with Alternative 3 would potentially subject people and structures to the effects of expansive soils, which could result in damage to structures. As with Alternatives 1 and 2, Alternative 3 would incorporate Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]) and would be designed in accordance with MRDC and CBC standards (or equivalent) specific to expansive soils.

Alternative 3 would not result in significant impacts, including the risk of loss, injury, or death related to expansive soils. Therefore, impacts related to expansive soils would be less than significant with design and construction performed per applicable design criteria, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Operation of the at-grade and above-grade structures associated with Alternative 4 would potentially subject people and structures to the effects of expansive soils, which could result in damage to structures. As with Alternatives 1, 2, and 3, Alternative 4 would incorporate Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]) and would be designed in accordance with MRDC and CBC standards (or equivalent) specific to expansive soils.

Alternative 4 would not result in significant impacts, including the risk of loss, injury, or death related to expansive soils. Therefore, impacts related to expansive soils would be less than significant with design and construction performed per applicable design criteria, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar, and the determination provided above for Alternative 1 is applicable to either Design Option 1 or 2. Impacts related to expansive soils would be less than significant with design and operation performed per applicable design criteria mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Bellflower and Paramount MSF site option locations and proposed improvements are substantially similar, and the determination provided above for Alternative 4 is applicable to either MSF site. Impacts related to expansive

soils would be less than significant with design and operation performed per applicable design criteria mandated by Project Measure GEO PM-1 (Geotechnical Design [Operation] [Section 4.9.4.1]), and mitigation would not be required.

4.9.5.8 Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Project Alternative

The geotech Affected Area for the No Project Alternative is in a highly urbanized area served by existing municipal sewage systems. Therefore, the operational-related impacts for the No Project Alternative would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station and Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternatives 1 and 2 are located in a highly urbanized area served by existing municipal sewage systems. The use of septic tanks or alternative wastewater systems is not anticipated under Alternatives 1 and 2. Therefore, Alternatives 1 and 2 would not expose people or structures to significant impacts involving the adequacy of soils to support septic tanks or alternative waste disposal systems. No impacts would occur, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Alternative 3 is located in a highly urbanized area served by existing municipal sewage systems. The use of septic tanks or alternative wastewater systems is not anticipated under Alternative 3. Therefore, Alternative 3 would not expose people or structures to significant impacts involving the adequacy of soils to support septic tanks or alternative waste disposal systems. No impacts would occur, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Alternative 4 is located in a highly urbanized area served by existing municipal sewage systems. The use of septic tanks or alternative wastewater systems is not anticipated under Alternative 4. Therefore, Alternative 4 would not expose people or structures to significant impacts involving the adequacy of soils to support septic tanks or alternative waste disposal systems. No impacts would occur, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The Design Option 1 and 2 locations and proposed improvements are substantially similar and are located in a highly urbanized area served by existing municipal sewage systems. The use of septic tanks or alternative wastewater systems is not anticipated for either design option. Therefore, Design Options 1 or 2 would not expose people or structures to significant impacts involving the adequacy of soils to support septic tanks or alternative waste disposal systems. No impacts would occur, and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: The Paramount and Bellflower MSF site option locations and proposed improvements are substantially similar and are located in a highly urbanized area served by existing municipal sewage systems. The use of septic tanks or

alternative wastewater systems is not anticipated for either MSF. Therefore, the Bellflower MSF or Paramount MSF would not expose people or structures to significant impacts involving the adequacy of soils to support septic tanks or alternative waste disposal systems. No impacts would occur, and mitigation would not be required.

4.9.5.9 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

For determination, see Section 4.14, Paleontological Resources.

4.10 Hazards and Hazardous Materials

This section describes existing hazards and hazardous materials (hazmat) in the Affected Area for hazards and hazmat. This section also summarizes the potential adverse effects under NEPA and significant impacts under CEQA through the introduction of hazardous materials or the mobilization of hazardous materials under the No Build Alternative and from operation of the four Build Alternatives, Design Options 1 and 2, and the Paramount and Bellflower MSF site options.

A review of the State of California, Los Angeles County Fire Hazard Severity Zone and CalFire Local Responsibility Area Maps indicates that the Affected Area for hazards and hazmat is characterized as an urban area. It would therefore not be subject to effects from wildland fire and, as such, wildland fire effects are not discussed further in this section. Additionally, there are no airports located within 2 miles of the Affected Area for hazards and hazmat. Therefore, effects related to airports are not discussed further in this section.

Refer to Section 4.18, Safety and Security, of this Draft EIS/EIR for an analysis of effects on adopted emergency response plans and emergency evacuation plans from operation of the Project. Refer to Section 4.9, Geotechnical, Subsurface, and Seismic, for an analysis of geologic hazards, hazardous subsurface gases, soils, and seismic risks from operation of the Project. Information in this section is based on the *West Santa Ana Branch Transit Corridor Project Final Hazardous Materials Impact Analysis Report* (Metro 2021p), attached as Appendix S to this Draft EIS/EIR, and the *West Santa Ana Branch Transit Corridor Project Final Geotechnical, Subsurface, and Seismic Impact Analysis Report* (Metro 2021e) (Appendix O).

4.10.1 Regulatory Setting and Methodology

4.10.1.1 Regulatory Setting

Hazards and hazardous materials are regulated at the federal, state, and local/regional levels. The following agencies and organizations have published guidelines or requirements for evaluation of methane and H_2S in the subsurface: USEPA, the city and county of Los Angeles, ASTM International, and California Department of Toxic Substances Control (DTSC). Additionally, city and county general plans that cover portions of the Affected Area for hazards and hazmat include hazardous material policies and emergency response plans. A summary of applicable laws and regulations is included below. For a comprehensive discussion of applicable regional and local plans and regulations related to hazards and hazardous materials, refer to Section 3 of the Hazardous Materials Impact Analysis Report (Appendix S).

Federal

The Resource Conservation and Recovery Act (RCRA) (42 U.S.C. Section 6901 et seq.) regulates the identification, generation, transportation, storage, treatment, and disposal of solid and hazardous materials and hazardous wastes through comprehensive "cradle to grave" tracking requirements.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. Section 9601 et seq.) provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. This act established the National Priorities List of contaminated sites and the Superfund cleanup program. CERCLA establishes requirements for abandoned hazardous waste sites and provides for liability of persons responsible for releases of hazardous waste at these sites.

The Superfund Amendments and Reauthorization Act (SARA) amends CERCLA and increases state involvement by requiring Superfund actions to consider state environmental laws and regulations. SARA also established a regulatory program for underground storage tanks (UST) and the Emergency Planning and Community Right-to-Know Act.

The Clean Air Act (42 U.S.C. Section 7401 et seq.) protects the public from exposure to airborne contaminants that are known to be hazardous to human health. Under the Clean Air Act, the USEPA 2019 established National Emissions Standards for Hazardous Air Pollutants, which includes asbestos.

The Clean Water Act (CWA) (Section 402[p]) (33 U.S.C. Section 1342[p]) regulates discharges and spills of pollutants, including hazardous materials, to surface waters and groundwater.

The Safe Drinking Water Act (42 U.S.C. Section 300[f] et seq.) regulates discharges of pollutants to underground aquifers and establishes standards for drinking water quality.

The Toxic Substances Control Act (15 U.S.C. Section 2601 et seq.) regulates manufacturing, inventory, and disposition of industrial chemicals, including hazardous materials. It addresses the production, importation, use, and disposal of specific chemicals, including polychlorinated biphenyls (PCBs), asbestos-containing materials (ACM), and lead-based paint (LBP).

The Hazardous Materials Transportation Act (49 U.S.C. Section 5101 et seq. and 49 CFR Parts 101, 106, 107, and 171-180) regulates the transport of hazardous materials by motor vehicles, rail, marine vessels, and aircraft.

The Hazardous Materials Transportation Uniform Safety Act (Public Law 101–615) regulates the safe transport of hazardous materials in intrastate, interstate, and foreign commerce. The statute includes provisions to encourage uniformity between different state and local highway routing regulations, to develop criteria for the issuance of federal permits to motor carriers of hazardous materials, and to regulate the transport of radioactive materials.

The Occupational Safety and Health Act of 1970 requires training handlers of hazardous materials, notifying employees who work in the vicinity of hazardous materials, acquiring Safety Data Sheets that describe the proper use of hazardous materials, and training employees to remediate any accidental releases of hazardous materials. It also regulates lead and asbestos as it relates to employee safety to reduce potential exposure. Additionally, it

requires contractors conducting LBP and ACM surveys and removal to be certified by the U.S. Occupational Safety and Health Administration (OSHA).

U.S. Presidential Executive Order 12088, issued in 1978, requires federal agencies to take necessary actions to prevent, control, and abate environmental pollution from federal facilities and activities under control by federal agencies.

State

California's hazardous waste regulations are similar to federal law, but more stringent in their application. Similar to RCRA, the Hazardous Waste Control Law (Cal. Health and Safety Code, Section 25100 et seq.) empowers the DTSC to administer the state's hazardous waste program and implement the federal program in California, including UST regulation. The DTSC additionally compiles and maintains a list of potentially contaminated sites located throughout the state in accordance with the Cortese Statute (California Government Code, Section 65962.5). While the DTSC has the primary responsibility for enforcement and implementation of hazardous waste control laws in the state, the responsibility is shared with other agencies, including the State Water Resources Control Board, the Los Angeles Regional Water Quality Control Board (LARWQCB), and county and city governments.

The Department of Conservation's Geologic Energy Management Division (CalGEM, formerly the Division of Oil, Gas, and Geothermal Resources or DOGGR) is responsible for implementing Section 3208.1 of the Public Resources Code (PRC). As a result, CalGEM developed the Construction Site Well Review Program to assist local permitting agencies to identify and review the status of oil/gas wells located near or beneath proposed structures (CalGEM 2020).

Regional and Local

The Affected Area for hazards and hazmat is located within Los Angeles County and extends through portions of the following cities: Los Angeles, Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Cerritos, Artesia, and the unincorporated community of Florence-Firestone. The Los Angeles County Department of Public Works (LACDPW) is a Certified Unified Program Agency (CUPA) and a participating agency to the Los Angeles County CUPA, managed by the Los Angeles County Fire Department, Health Hazardous Materials Division. The LACDPW Environmental Programs Division permits and inspects USTs in the unincorporated areas of Los Angeles County and 77 cities, including Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Cerritos, and Artesia. The City of Vernon Health Department and the City of Los Angeles Fire Department manage their own CUPAs for USTs in their jurisdiction.

As discussed in detail in Section 4.9, Geotechnical, Subsurface, and Seismic, the City of Los Angeles maintains a Methane Ordinance (175790) that requires projects located within a methane zone or methane buffer zone comply with the Methane Mitigation Standard as outlined in the Methane Seepage Regulations (Division 71, Section 91-7101 to 91-7109), and as directed and approved by the Los Angeles Department of Building and Safety (LADBS) and the Los Angeles Fire Department (LADBS approach).

4.10.1.2 Methodology

Pursuant to NEPA regulations (40 CFR 1500–1508), project effects are evaluated based on the potentially affected environment. The effectiveness of measures to avoid, minimize, and/or mitigate effects is considered in making significance determinations under NEPA.

To satisfy CEQA requirements, hazardous-related impacts are analyzed in accordance with Appendix G of the *CEQA Guidelines*, identified in Section4.10.5.

The assessment is based on the environmental conditions in the Affected Area for hazards and hazmat and on applicable laws and regulations related to hazards and hazardous materials issues (summarized in Section 4.10.1.1). The term "environmental condition" refers to potential or existing site conditions that may present environmental health and safety concerns during operation of the Project. For the purpose of the assessment, the Affected Area for hazards and hazmat encompasses a 200-foot radius surrounding the project footprint. The project footprint includes the proposed alignments and appurtenant structures, including stations, MSF site options, and parking facilities. This area is sufficiently representative of the existing hazards and hazardous materials conditions that have the potential to result in impacts/effects due to the Project. Therefore, this area provides an accurate basis for the assessment of the potential for the introduction or mobilization of hazardous materials that have the potential to result from the Project.

The California PRC § 21151.4 requires projects located within 0.25 mile of a school to discuss potential effects with the appropriate school district if a project could reasonably be anticipated to emit hazardous air emissions, or handle an extremely hazardous substance or a mixture containing extremely hazardous substances in a quantity equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code. This analysis therefore identifies educational facilities within 0.25 mile of the Project that could be affected by its construction and/or operation. For the purposes of the analysis presented herein related to educational facilities, the Affected Area for hazards and hazmat is 0.25 mile (Affected Area for hazards and hazmat [educational facilities]). Similarly, due to the requirements of CCR Title 27, for the purpose of the analysis presented herein related to landfills, the Affected Area for hazards and hazmat is also 0.25 mile (Affected Area for hazards and hazmat [landfills]).

The methodology for the assessment of existing environmental concerns (or environmental conditions) sites follows portions of ASTM International 1528-14 Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (ASTM 2014) and the Caltrans *Environmental Handbook,* "Chapter 10 – Hazardous Materials, Hazardous Waste, and Contamination" (Caltrans 2014).

Hazardous wastes and substances (materials) are defined by the California Department of Industrial Relations as follows.

A hazardous substance is:

> "any substance designated or listed under A. through D. below, exposure to which results or may result in adverse effects on the health or safety of employees:
>
> A. Any substance defined under Section 103(14) of CERCLA or under Sections 25316 and 25317 of the California Health and Safety Code;
> B. Any biological agent and other disease-causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions

(including malfunctions in reproduction) or physical deformations in such persons or their offspring;

C. Any substance listed by the U.S. Department of Transportation and regulated as hazardous materials under 49 CFR 172.101 and appendices; and
D. Hazardous waste as herein defined." (California Department of Industrial Relations [DIR], 2018).

A hazardous waste is a waste or combination of wastes as defined in:

A. 40 CFR 261.3, or regulated as hazardous waste in California pursuant to Chapter 6.5, Division 20, California Health and Safety Code
B. Those substances defined as hazardous wastes in 49 CFR 171.8 (DIR 2018)

Within urban environments, hazardous materials including petroleum products from gasoline and automotive service stations, cleaning solvents from dry cleaning operations, and various other hazardous materials at manufacturing and storage properties are the most prevalent. Methane and H_2S gas may be naturally present in the soil and are also considered hazardous materials.

Known environmental concern sites are properties with known releases of hazardous materials to soil, groundwater, surface water, and/or soil vapor. These releases may be open or closed site release cases with local, regional, or state agencies such as the LACDPW, the Los Angeles City Fire Department, the LARWQCB, and/or the DTSC. Both open and closed release sites may have residual impacts remaining in soil, ground or surface water, and/or soil vapor. Known environmental concern sites are considered high-risk sites likely requiring hazardous material management and special design features and/or long-term monitoring.

Potential environmental concern sites include properties with known storage, handling, and use of hazardous materials, for example those currently occupied by gasoline service stations, dry cleaning facilities, manufacturing and industrial sites, oil fields/wells, aboveground storage tank sites, and electrical substations. Potential environmental concern sites are considered medium risk sites that require some environmental testing prior to construction to verify extent and nature of the site and possibly hazardous material management during construction; however, long-term monitoring is not expected.

Historical environmental concern sites include properties that may have formerly stored, handled, and used hazardous materials. They additionally include properties that may have residual impacts from past uses; there is typically limited information available about such properties. Historical environmental concern sites are considered low-risk sites that may require environmental assessment or testing prior to construction and/or may require hazardous material management during construction.

The following are the key steps to identifying potential or existing environmental concerns that may present environmental health and safety concerns in the Affected Area for hazards and hazmat:

- Review regulatory databases: Review of federal, state, local, and tribal environmental database records of known or potentially hazardous waste sites, and sites currently under investigation for environmental violations in the Affected Area for hazards and hazmat. The database reports identify sites with documented use, storage, or release of hazardous materials or petroleum products (see Appendix C of the Hazardous

Materials Impact Analysis Report for a complete list of queried databases and all sites identified within the 0.125-mile search radius of the alignment centerline).

- Review historical environmental records: Review and interpret available historical aerial photographs and Sanborn Fire Insurance Maps for evidence of previous site activities and development that would suggest the potential presence of hazardous substances in the Affected Area for hazards and hazmat.
- Perform site reconnaissance: Perform a windshield site reconnaissance of the Affected Area for hazards and hazmat from public rights-of-way to identify existing land uses and features that appear to have hazardous waste issues or visible indications of contamination.
- Apply ranking criteria: Rank environmental concern sites located in the Affected Area for hazards and hazmat based on its potential to result in adverse effects. Environmental concern sites were categorically ranked (known, potential, and/or historical environmental concern sites) in decreasing order of severity.

4.10.2 Affected Environment and Existing Conditions

4.10.2.1 Environmental Concern Sites Identified in Historical Aerial Photographs and Sanborn Fire Insurance Maps

A review of historical aerial photographs and maps indicate the presence of various commercial and industrial facilities of environmental concern including but not limited to the following in the Affected Area for hazards and hazmat: auto repair shops, gasoline service stations, and dry cleaners. Also depicted are rail lines and spurs within and in areas adjoining the Affected Area for hazards and hazmat that date back as far as 1894. Parcels identified with historical site uses of concern were added to the list of environmental concerns as sites of historical environmental concern in Appendix B of the Hazardous Materials Impact Analysis Report (Appendix S).

4.10.2.2 Environmental Concern Sites Identified in Regulatory Databases

Environmental database report listings were reviewed to identify the presence of environmental concern sites in the Affected Area for hazards and hazmat and to determine if present environmental concern sites are likely to result in adverse effects. The criteria used to evaluate the potential for adverse effects are described in Section 4.10.1.2. The database reports identified the following: historically contaminated properties, businesses that use, generate, or dispose of hazardous materials or petroleum products in their operations, and active contaminated release sites currently under assessment and/or remediation. Identified environmental concern sites are included in Appendix B and Appendix G of the Hazardous Materials Impact Analysis Report (Appendix S).

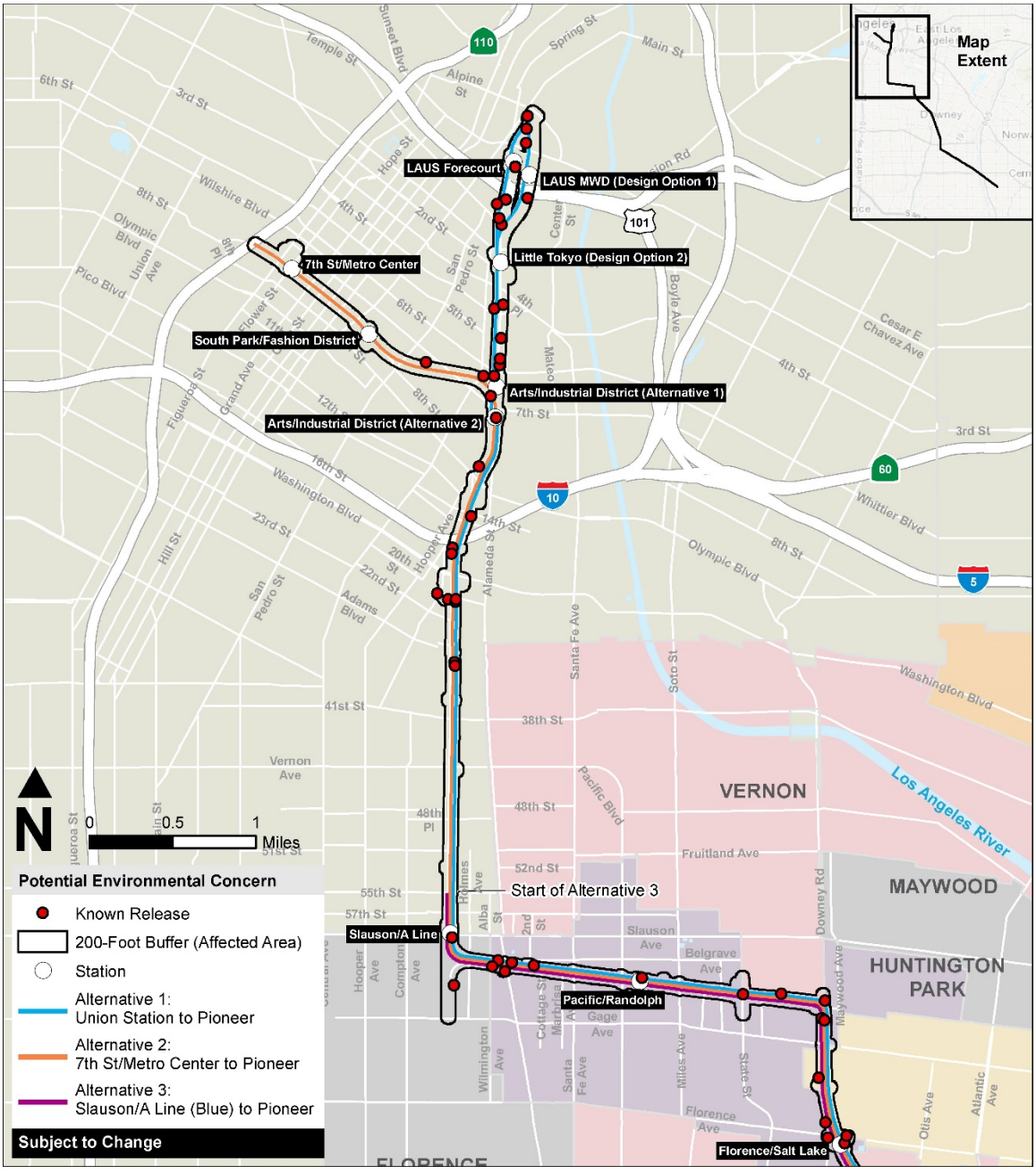
The total number of environmental concern sites (including known, potential, and historical) located in the Affected Area for hazards and hazmat are listed in Table 4.10.1. Additionally, Figure 4.10-1 through Figure 4.10-3 identify properties where releases of hazardous materials to soil, groundwater, surface water, and/or soil vapor are known to have occurred. These properties are considered high-risk sites that would likely require hazardous material management and special design features and/or long-term monitoring.

Table 4.10.1. Summary of Environmental Concern Sites in Affected Area for Hazards and Hazmat[1]

Environmental Concern Category	Alternative 1 (Forecourt)	Alternative 2	Alternative 3	Alternative 4	Design Option 1 Only	Design Option 2 Only	Paramount MSF Option Only	Bellflower MSF Option Only	Types of Regulatory Government Agency Listings
Known Environmental Concern (number of sites)	85	72	58	14	1	0	6	0	Known Release Sites (confirmed release sites)
Potential Environmental Concern (number of sites)	123	127	80	27	4	1	3	0	Potential Release Sites and Large Quantity Generators of Hazardous Materials and Storage Facilities
Historical Environmental Concern (number of sites)	411	435	160	38	18	0	0	3	Sites with Historical Use of Hazardous Materials
Total Environmental Concerns (number of sites)	**619**	**634**	**298**	**79**	**23**	**1**	**9**	**3**	**Known, Potential, and Historical**

Source: Metro 2021p
Notes: [1] Many parcels have more than one listing and were tallied once according to their highest risk level
MSF = maintenance and storage facility

Figure 4.10-1 Known Environmental Concern Sites (from Los Angeles Union Station to City of Huntington Park)



Source: Prepared on behalf of Metro in 2020

Figure 4.10-2 Known Environmental Concern Sites (from Florence-Firestone to City of South Gate)

Source: Prepared on behalf of Metro in 2020

Figure 4.10-3 Known Environmental Concern Sites (from City of South Gate to City of Artesia)

Source: Prepared on behalf of Metro in 2020

Groundwater Contamination

A list of environmental concern sites within the Affected Area for hazards and hazmat is included in Appendix B and Appendix G of the Hazardous Materials Impact Analysis Report (Appendix S). The total numbers of environmental concern sites with contaminated groundwater located in the Affected Area for hazards and hazmat are as follows:

- Alternative 1 – 30 sites
- Alternative 2 – 27 sites
- Alternative 3 – 22 sites
- Alternative 4 – 8 sites
- Design Option 1 (MWD) – 1 site[5]
- Design Option 2 (Little Tokyo) – 0 sites
- Paramount MSF site option – 4 sites
- Bellflower MSF site option – 0 sites

Landfills

Municipal waste landfills have the potential to release methane gas that may present a health and/or explosion risk. Four current or former solid waste landfills were identified within the Affected Area for hazards and hazmat (landfills) of Alternatives 1, 2, and 3: Wilmington Avenue Dump, Huntington Park City Dump, Caltrans South Gate, and South Gate Rod and Gun Club (former landfill). Methane gas was not detected at Wilmington Avenue Dump, Huntington Park City Dump, or Caltrans South Gate. However, it remains unclear whether soil vapor testing for methane or other constituents has been completed at the South Gate Rod and Gun Club. Soil contamination from metals, organochlorine pesticides, petroleum hydrocarbons, semi-volatile organics, and toluene is a concern at the South Gate Rod and Gun Club site due to the following health risks associated with the known or potential contaminants:

- Methane gas is non-toxic, odorless, colorless, explosive, flammable, and acts as an asphyxiant by displacing oxygen in the atmosphere.
- Ingestion, inhalation, and dermal exposure to petroleum hydrocarbons could result in various cancers, birth defects, and/or other reproductive harm (Prop 65 2020).
- Inhalation and/or ingestion of organochlorine pesticides could cause thyroid, bladder, liver, kidney, and/or central nervous system damage, and possibly cancer (Delaware Health and Social Services [DHSS] 2020).
- Inhalation, ingestion, and/or dermal exposure to various metals can cause kidney, and blood damage as well as central nervous system, gastrointestinal system, reproductive system, and/or cardiovascular system health effects (Diagnose 2020).
- Inhalation, ingestion, and absorption of semi-volatile organic compounds may cause allergies, asthma, endocrine and thyroid disruption, reproductive toxicity, and fetal and child development delays (USEPA 2016).
- Inhalation of toluene could cause central nervous system damage and chronic exposure may cause hearing and color vision loss, or brain damage (Agency for Toxic Substances and Disease Registry [ATSDR] 2020c).

[5] This number represents the total number of environmental concern sites with contaminated groundwater in the Affected Area for hazards and hazmat of Design Option 1 (MWD) only. The total number of sites in the Affected Area for hazards and hazmat of Alternative 1 with Design Option 1 (MWD) is 29.

4.10.2.3 General Hazardous Materials Conditions

In addition to the current railroad corridor ROW, existing land uses in the Affected Area for hazards and hazmat include industrial, commercial, retail, and residential uses. The general hazardous material conditions described below are likely to be encountered in one or more locations in the Affected Area for hazards and hazmat.

Lead-Based Paint

LBP is recognized as a potential health risk due to the known toxic effects of lead exposure on the central nervous system, blood stream, and other vital organs such as the kidney. Lead exposure occurs primarily through the ingestion of LBP. LBP was banned for residential and consumer use in 1978, and lead solder used in plumbing was banned in 1988. The use of LBP is still allowed for industrial purposes. LBP may be present on or in buildings and structures in the Affected Area for hazards and hazmat.

The risk of lead toxicity in LBP varies according to the condition of the paint and the year of its application. Structures built before 1978 are likely to contain elevated concentrations of LBP. Structures of concern in the Affected Area for hazards and hazmat include residences painted prior to 1977 and other structures that include painted surfaces (such as barns, sheds, commercial buildings, warehouses, industrial structures, equipment utility sheds, bridges, and roads that feature yellow thermoplastic or yellow painted traffic stripes and pavement markings). Additionally, weathering and routine maintenance of paint on buildings may have contaminated nearby soils with lead.

Aerially Deposited Lead

Aerially deposited lead (ADL) was historically deposited by cars burning leaded gasoline and is often found in the soil adjacent to highways and roads. Elevated concentrations of ADL may be present along existing roadways, including those throughout the Affected Area for hazards and hazmat. If ADL is ingested into the body, it can cause damage to the nervous system and/or blood cells. As identified in the Hazards and Hazardous Materials Impact Analysis Report (Appendix S), soil along highways in the Affected Area for hazards and hazmat may contain concentrations of lead exceeding state regulatory thresholds, and any waste generated from the disturbance of soil in these locations may be regulated as a hazardous waste. Soil and grade crossings within the Affected Area for hazards and hazmat are likely to be contaminated with ADL due to the proximity of several highways including, but not limited to, the following:

- Santa Ana Freeway (US-101)
- Santa Monica Freeway (I-10)
- Long Beach Freeway (I-710)
- Pasadena Freeway (I-110)
- Glenn Anderson Freeway (I-105)
- San Gabriel River Freeway (I-605)
- Artesia Freeway (SR-91)

In addition, multiple county and city roads have existed for decades in areas adjacent to the alternative alignments in the Affected Area for hazards and hazmat, including, but not limited to, the following:

- Alameda Street
- Long Beach Avenue
- Pacific Boulevard
- Randolph Street
- Salt Lake Avenue
- N. Vignes Street

Asbestos-Containing Material

The inhalation of asbestos fibers can lead to various cancer and non-cancer diseases such as asbestosis, pleural disease, lung cancer, mesothelioma, and various other cancers (larynx, ovary, pharynx, stomach, and colorectum) (ATSDR 2020d). In December 1977, the United States Consumer Product Safety Commission restricted the use of ACMs, including patching compounds and artificial fireplace ash products. A review of historic-period aerial photographs indicates that many structures in the Affected Area for hazards and hazmat were constructed prior to 1989. Therefore, it is likely that ACMs are present in a majority of those structures, including residential, commercial, and industrial structures, throughout the Affected Area for hazards and hazmat.

Common Railroad Corridor Contaminants

The following railroad lines and spurs currently traverse the Affected Area for hazards and hazmat:

- Wilmington Branch ROW from south of Washington Boulevard to Slauson Avenue
- La Habra Branch ROW located along Randolph Street from Slauson Avenue to Salt Lake Avenue
- San Pedro Subdivision from Randolph Street to Rosecrans Avenue
- PEROW from Rosecrans Avenue to South Street

In addition to those that remain, the industrial areas in the Affected Area for hazards and hazmat formerly included many additional railroad lines and spurs. Contaminants common in railway corridors include petroleum hydrocarbons, naphthalene, pesticides and herbicides, polycyclic aromatic hydrocarbons (PAHs), and heavy metals, including arsenic and lead. Unused and abandoned railroad ties may also remain onsite and would require special handling and disposal. The following health effects are associated with these common railroad-associated contaminants if ingestion, inhalation, and/or dermal exposure were to occur:

- Various cancers, birth defects, and/or other reproductive harm (ATSDR 2020a; California Office of Environmental Health Hazard Assessment 2020)
- Cataracts or retinal hemorrhage, as well as reproductive and developmental effects (USEPA 2020)
- Thyroid, bladder, liver, kidney, and/or central nervous system damage (DHSS 2020)
- Dermal skin irritations, allergic reactions and nervous system disorders (Healthfully 2020)
- Increased risk for diabetes and high blood pressure (Centers for Disease Control and Prevention [CDC] 2020a)
- Kidney, blood, and nervous system damage (CDC 2020b)

Hazardous Material Pipeline Utility Corridor Contaminants

The Affected Area for hazards and hazmat includes urban areas and associated utilities, such as crude oil, natural gas, and hydrocarbon product pipelines. Ingestion, inhalation, and dermal exposure to petroleum hydrocarbons could result in various cancers, birth defects, and/or other reproductive harm (Prop 65 2020). Utility-related contaminants that may be present in environmental media within the Affected Area for hazards and hazmat include petroleum hydrocarbons, volatile organic compounds, and metals.

Pesticides and Agricultural Use

A review of historical-period aerial photographs indicates that most of the parcels in the Affected Area for hazards and hazmat were developed prior to 1948. However, prior to the presence of current development, the Affected Area for hazards and hazmat may have been subject to regular applications of fertilizers, pesticides, or other chemicals for maintenance in support of former agricultural use. Although there are currently no agricultural properties located in the Affected Area for hazards and hazmat, it is possible that agricultural chemicals were formerly used, stored, and/or mixed in or adjacent to the Affected Area for hazards and hazmat, and that chemical residues from such historical agricultural activities may be present in environmental media. Inhalation and/or ingestion of organochlorine pesticides could cause thyroid, bladder, liver, kidney, and/or central nervous system damage, and possibly cancer (DHSS 2020). Herbicides affect human health through dermal exposure, ingestion, or inhalation, which may result in dermal skin irritations or allergic reactions, various cancers, and nervous system disorders (Healthfully 2020).

Polychlorinated Biphenyls

PCBs may be encountered in fluorescent lighting ballasts, transformers, elevators, electrical substations, vehicle service lifts, and other areas where hydraulic equipment was used historically. During the site reconnaissance, pad and pole-mounted transformers, and stationary and mobile hydraulic equipment were observed at multiple locations in the Affected Area for hazards and hazmat. Inhalation, ingestion, and dermal exposure to PCBs may cause health effects such as acne-like skin conditions in adults and neurobehavioral and immunological changes in children (ATSDR 2020b).

Structures in the Affected Area for hazards and hazmat were not accessible during the site reconnaissance, and no information regarding the age of lighting ballasts in these buildings or disposal of ballasts was available for analysis for this study. While some or many of the ballasts in buildings within the Affected Area for hazards and hazmat may contain PCBs, the potential effects associated with PCBs were not assessed, but were assumed to be present due to the lack of available data regarding their presence.

4.10.2.4 Educational Facilities in Proximity to Hazardous Materials

Educational facilities located within the Affected Area for hazards and hazmat (educational facilities) are identified in Table 4.5 and Figures 4-3 through Figure 4-5 of the Hazardous Materials Impact Analysis Report (Appendix S). The total number of educational facilities located in the Affected Area for hazards and hazmat (educational facilities) of Alternatives 1,

2, 3, and 4, Design Options 1 (MWD) and 2 (Little Tokyo), and the Paramount and Bellflower MSF site options are as follows:

- Alternative 1 – 53 educational facilities
- Alternative 2 – 56 educational facilities
- Alternative 3 – 37 educational facilities
- Alternative 4 – 17 educational facilities
- Design Option 1 (MWD) – 2 educational facilities[6]
- Design Option 2 (Little Tokyo) – 4 educational facilities[7]
- Paramount MSF site option – 4 educational facilities
- Bellflower MSF site option – 2 educational facilities

Individuals who may be particularly sensitive to hazardous materials exposure (toddlers, children, teens, and young adult) are the primary users of educational facilities. Therefore, additional protective regulations apply to projects that may use or disturb potentially hazardous materials near or at schools.

4.10.2.5 Oil and Gas Wells, Fields, and Hazardous Subsurface Gases

Figure 4.10-4 depicts the abandoned oil/gas wells and the methane zones and buffer zones in the Affected Area for hazards and hazmat. Areas within and around oil wells and fields, methane zones, and buffer zones may contain naturally occurring methane and/or H_2S gases. The total number of abandoned oil/gas wells located within the Affected Area for hazards and hazmat are as follows:

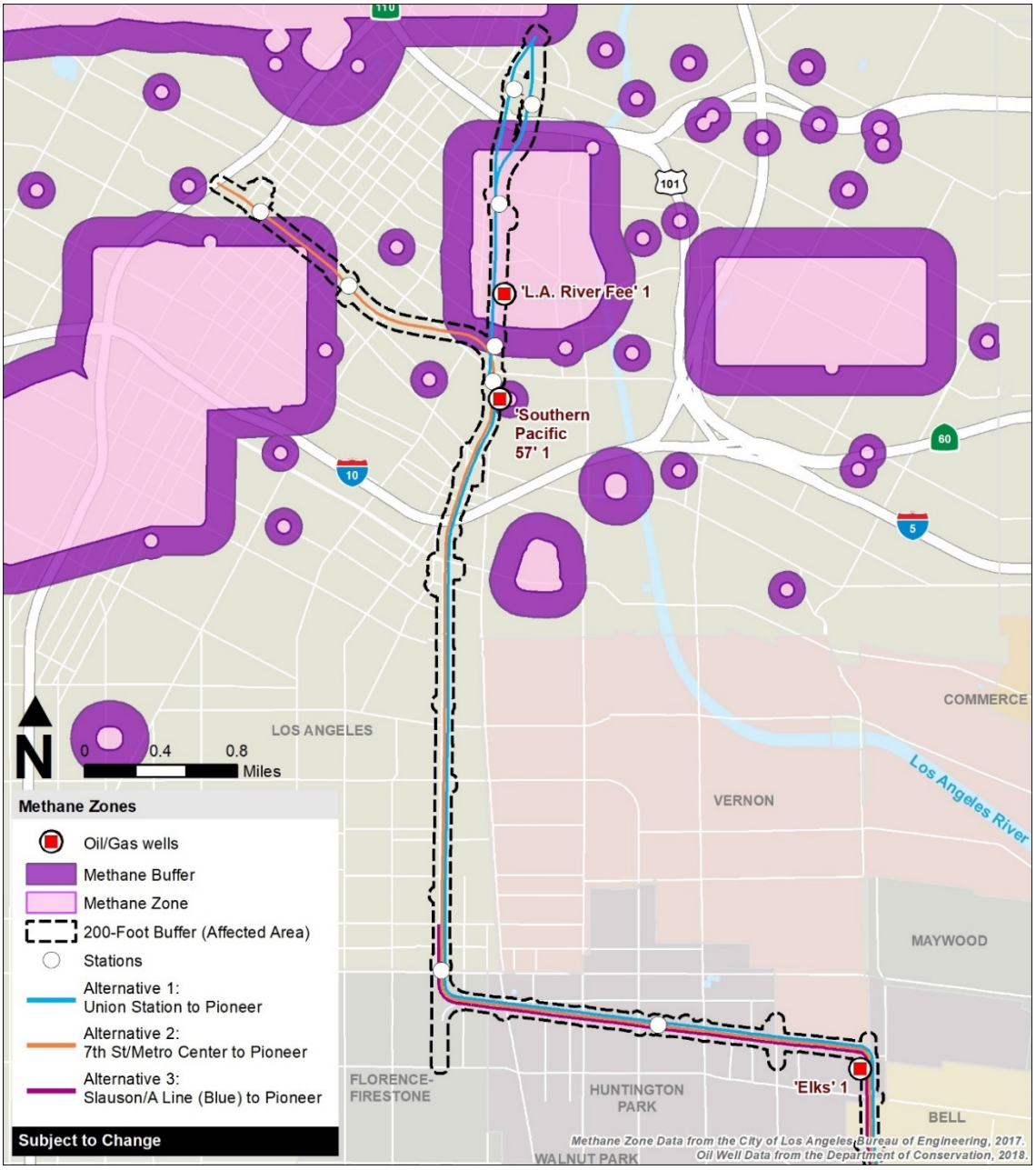
- Alternative 1 – 3 oil/gas wells ('LA River Fee' 1, 'Southern Pacific 57' 1, and 'Elks' 1)
- Alternative 2 – 2 oil/gas wells ('Southern Pacific 57' 1 and 'Elks' 1)
- Alternative 3 – 1 oil/gas well ('Elks' 1)
- Alternative 4 – 0 oil/gas wells
- Design Option 1 (MWD) – 0 oil/gas wells
- Design Option 2 (Little Tokyo) – 0 oil/gas wells
- Paramount MSF site option – 0 oil/gas wells
- Bellflower MSF site option – 0 oil/gas wells

The Affected Area for hazards and hazmat passes through CalGEM District 1 in Los Angeles County, which includes thousands of active and abandoned oil and gas wells (DOGGR 2017). Portions of the Affected Area for hazards and hazmat of Alternatives 1 and 2 include oil fields—for example, the Los Angeles and Union Station Oil Fields, Methane Zones, and Methane Buffer Zones.

[6] This number represents the total number of educational facilities in the Affected Area for hazards and hazardous materials (educational facilities) of Design Option 1 (MWD). These educational facilities are also in the hazards and hazardous materials of Alternative 1.

[7] This number represents the total number of educational facilities in the Affected Area for hazards and hazardous materials (educational facilities) of Design Option 2 (Little Tokyo). Three of these educational facilities are also in the hazards and hazardous materials of Alternative 1.

Figure 4.10-4. Abandoned Oil/Gas Wells and Methane Zones and Buffer Zones



Source: Metro 2021p

Common issues associated with oil field and methane zone properties include the presence of operating wells and/or pipelines, release of methane and/or H_2S gas, oil seepage, contaminated soils and groundwater, leaking oil/gas wells, and abandoned wells not plugged and abandoned to current standards. Both methane and H_2S can seep from the surrounding soils, fractures, and/or faults in the deep bedrock, and into existing buildings, basements, manholes, utility vaults, sewer lines, open trenches, excavations, and tunnels where they may accumulate and create hazardous conditions. Further information regarding the characteristics of subsurface gas is included below with additional information in Section 4.9, Geotechnical, Subsurface, and Seismic.

Subsurface Gas Characteristics

Hydrogen Sulfide Gas: H_2S is a poisonous, corrosive, and flammable colorless gas. It is an irritant and chemical asphyxiant that may be highly toxic when inhaled. It is heavier than air and may accumulate within depressed areas, such as at the bottom of poorly ventilated spaces. Although it is soluble in water, it can accumulate below ground in addition to above the groundwater table. Air and H_2S mixtures can be explosive and, when ignited, burn to produce other gases such as sulfur dioxide, a toxic vapor or gas. The explosive range of H_2S in air is at concentrations between 4.5 and 45.5 percent (OSHA 2019a). The health exposure limits associated with H_2S gas are as follows:

- OSHA recommends a limit of 10 ppm time weighted average (TWA) for construction projects (OSHA 2019b).
- The ACGIH recommends a threshold limit value (TLV) of 1 ppm as an 8-hour TWA and a short-term exposure limit (STEL) of 5 ppm (OSHA 2019a).
- The OSHA permissible exposure limits (PEL) are 10 ppm (8-hour TWA), 15 ppm (STEL), and 50 ppm (ceiling limit) (OSHA 2019b).
- TWAs describe the average exposure concentration over a set period, specifically a standard 8-hour shift, based upon a 40-hour workweek. TLVs refer to airborne concentrations of chemical substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse effects (OSHA 2019c).
- STELs refer to the maximum exposure allowed during a 15-minute period (OSHA 2019a) and ceiling limits refer to the maximum exposure limit, which cannot be exceeded for any length of time.

Radon Gas: Radon gas is produced by the decay of uranium, which may be naturally present at varying levels in soil and rock. Once present, the gas moves through the ground and may enter structures through utility corridors, openings or cracks in foundations, and construction joints. Radon gas is very dense and may accumulate in basements or crawl spaces. Radon exposure has been linked to lung cancer. The USEPA action level for radon is above 4.0 pCi/l of air. The USEPA has mapped Los Angeles County as a Zone 2 radon area, which is defined as an area with a general indoor radon potential of between 2.0 and 4.0 pCi/l (USEPA 2019). Radon is not anticipated to be present at harmful concentrations in the Affected Area for hazards and hazmat and is therefore not discussed further in this section.

Methane Gas: Both methane and H_2S gas are commonly present in landfills and oil/gas fields. Methane gas is non-toxic, odorless, colorless, explosive, flammable, and acts as an asphyxiant by displacing oxygen in the atmosphere. Unlike H_2S, methane is lighter than air and may spread easily within work areas associated with the Build Alternatives. Symptoms of methane exposure could occur when methane is present in oxygen-deficient environments, such as when oxygen is below 19.5 percent by volume due to displacement by methane or other gases (Airgas 2019).

The flammable limits for methane range from 5 to 14 percent when within regular atmospheric oxygen levels (around 19.5 to 21 percent by volume). These percentages are known as the lower explosive limit (LEL; 5 percent) and upper explosive limits (UEL; 14 percent). The 2019 Safety Data Sheet for methane indicates that there are no specific exposure limits for methane; however, oxygen levels should be maintained above 19.5 percent by volume (Airgas 2019).

In addition, the current California Title 8 Regulations (DIR 2019) indicate that the following tunnel safety conditions should be monitored:

- "(a) A concentration of 20 percent of the LEL of flammable gas has been detected not less than 12 inches (304.8 millimeters) from any surface in any open workings with normal ventilation.
- (b) A concentration of 20 percent of LEL petroleum vapors has been detected not less than three inches from any surface in any open workings with normal ventilation.
- (c) A notice of the classification and any special orders, rules, special conditions, or regulations to be used shall be prominently posted at the tunnel job site, and all personnel shall be informed of the classification.
- (d) The Division shall classify or reclassify any tunnel as gassy or extra hazardous if the preliminary investigation or past experience indicates that any gas or petroleum vapors in hazardous concentrations is likely to be encountered in such tunnel or if the tunnel is connected to a gassy or extra hazardous excavation and may expose employees to a reasonable likelihood of danger.
- (e) For the purpose of reclassification and to ensure a proper application of classification, the Division shall be notified immediately if a gas or petroleum vapor exceeds any one of the individual classification limits described in subsection (b) above. No underground works shall advance until reclassification has been made."

OSHA does not currently have a PEL for methane; however, the National Institute of Occupational Safety and Health reportedly recommends 1,000 ppm (0.1 percent) as a maximum safe methane concentration for workers during an eight-hour period (Agri-Facts 2004).

As of the date of this report, there have been no comprehensive methane soil vapor investigations completed within the Affected Area for hazards and hazmat. However, methane and H_2S are expected to be present in the soil vapor within the Affected Area for hazards and hazmat of Alternatives 1 and 2. As with other Metro projects, Metro has defined "elevated" gas conditions as areas where gas monitoring readings have shown methane levels greater than 5 percent (corresponding to the LEL) or H_2S levels above 5 ppm (corresponding to the ACGIH STEL). Due to constraints associated with testing and measuring soil gas concentrations in the Affected Area for hazards and hazmat for all of the Build Alternatives, soil gas concentrations in the Affected Area for hazards and hazmat have not yet been tested or measured; however, they would be tested and measured in the Affected Area for hazards and hazmat of the chosen alternative prior to construction. For the purposes of the current analysis, it is assumed that some measured concentrations would be over the thresholds. Metro will employ a LADBS approach to verify and evaluate methane and H_2S gas concentrations in the sub-surface. Specifically, soil gas investigations would be performed along the alignment during final design to verify conditions, and following review of the data, specific requirements would be designed and implemented as appropriate for the methane and H_2S concentrations present.

4.10.3 Environmental Consequences and Environmental Impacts

4.10.3.1 No Build Alternative

Under the No Build Alternative, regional and local projects designed and operated to established regulations and standards related to hazardous materials and hazards would continue to be built. Therefore, adverse effects are not anticipated. However, under the No Build Alternative, the remediation of pre-existing contaminated areas that would take place

under the Build Alternatives would not occur. Therefore, under the No Build Alternative, there would be no potential long-term benefits related to the remediation of pre-existing contaminated soils.

4.10.3.2 Alternative 1: Los Angeles Union Station to Pioneer Station

Environmental Concern Sites

Known, Potential, and Historical Concern Sites: There are 619 known, potential, and historical environmental concern sites in the Affected Area for hazards and hazmat of Alternative 1. These sites, summarized in Table 4.10.1 and detailed in Appendix B of the Hazardous Materials Impact Analysis Report [Appendix S]), are as follows:

- 85 known release sites (30 with contaminated groundwater)
- 123 potential environmental concern sites
- 411 historical environmental concern sites

Soil disturbance would not occur during the operation of Alternative 1 and disturbance of soil, soil vapor, and groundwater at environmental concern sites is therefore not expected. Contaminants associated with environmental concern sites would not be encountered during the operation of Alternative 1. Under NEPA, the operation of Alternative 1 would result in no adverse effects related to environmental concern sites.

Landfills: One former landfill (South Gate Rod and Gun Club) with potential soil vapor concerns is located in the Affected Area for hazards and hazmat (landfills) of Alterative 1, within a proposed laydown yard. Should methane or other gases be present at the landfill and accumulate near the Project, a health and explosion hazard may exist in the Affected Area for hazards and hazmat of Alternative 1 during operation.

Methane gas is anticipated in the Affected Area for hazards and hazmat of Alternative 1. Therefore, sampling to verify the presence of methane and other gases would be conducted to support the advancement of project design. If sampling determines that subsurface methane or other gases are present, design of the Project would include the installation of gas monitoring and detection systems with alarms, as well as ventilation equipment to dissipate gas to safe levels according to Metro's current design criteria for operation, as described in Mitigation Measure GEO-1 (Hazardous Gas [Operations]). With implementation of GEO-1 (Hazardous Gas [Operations]), operation of Alternative 1 would result in no adverse effects related to potential landfill gases.

Groundwater Contamination: Thirty sites with known groundwater contamination are present within the Affected Area for hazards and hazmat of Alternative 1. Long-term groundwater monitoring or dewatering may be necessary during operation of Alternative 1. In locations that would require monitoring or dewatering where groundwater has been contaminated by hazardous materials, ongoing management or treatment would be required and an adverse effect would occur. In locations where long-term contaminated groundwater dewatering is necessary, Project Measure HAZ PM-2 (Disposal of Groundwater [Operation]), which requires LARWQCB consultation and permit compliance, would be implemented. With implementation of HAZ PM-2 (Disposal of Groundwater [Operation]), operation of Alternative 1 would result in no adverse effects related to groundwater contamination or dewatering.

General Hazardous Material Conditions

LBP, ADL, Asbestos/ACM, Railroad, Pipelines, Agriculture, PCBs: Operation of Alternative 1 would not utilize or encounter LBP, ACM, common railroad corridor or hazardous material pipeline utility corridor contaminants, pesticides from agricultural use, ADL, or PCBs. These contaminants are all associated with demolition activities and/or soil disturbance, which would not occur during operation of Alternative 1. Operation of Alternative 1 would not include the use of hazardous materials or wastes for maintenance and operational purposes. Therefore, operation of Alternative 1 would result in no adverse effects related to the above-listed hazardous materials.

If future maintenance that requires soil disturbance is necessary during project operation, residual contamination may be encountered during soil disturbing activities. If residual contamination is encountered during operation, an adverse effect could occur. In the event that soil disturbance is necessary during operation, Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]) would be implemented to avoid and minimize the exposure of work crews and the general public to potentially contaminated soil. With implementation of HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), operation of Alternative 1 would result in no adverse effects related to potentially contaminated soil.

Educational Facilities

There are 53 educational facilities located within the Affected Area for hazards and hazmat (educational facilities) of Alternative 1. Hazardous materials in quantities equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code (Section 4.10.1.2) would not be used during operation of Alternative 1. Additionally, operation of Alternative 1 is not expected to create hazardous air emissions within the Affected Area for hazards and hazmat (educational facilities) of Alternative 1. Under NEPA, operation of Alternative 1 would result in no adverse effects related to educational facilities.

Oil and Gas Wells, Fields, and Hazardous Subsurface Gases

In addition to this section of the Draft EIS/EIR, subsurface gases are described and analyzed in the Geotechnical, Subsurface, and Seismic Section (Section 4.9.2.7 under the heading "Naturally Occurring Oil and Gas," and Section 4.9.3.3 under the heading "Naturally Occurring Subsurface Gas.")

Three abandoned oil wells have been identified within the Affected Area for hazards and hazmat (outside the project footprint) of Alternative 1. Additionally, unidentified abandoned oil wells may be present throughout the Affected Area for hazards and hazmat of Alternative 1. Operation of Alternative 1 has the potential to result in adverse effects associated with known and unidentified abandoned wells. Although the three known oil/gas wells in the Affected Area for hazards and hazmat are reportedly abandoned, they may not have been abandoned to current CCR standards. Therefore, the accidental release of subsurface gas could occur as a result of damage to wells caused by project-related vibration.

In addition to abandoned oil/gas wells, hazardous subsurface gases are assumed to be present in the vicinity of the underground stations and tunnels and venting systems

proposed under Alternative 1. If subsurface gases accumulate within tunnels, a potential fire and/or explosion hazard would be posed during operation of Alternative 1. Additionally, accumulation of methane gas could displace oxygen in the breathing zone and accumulation of H_2S would be highly toxic when inhaled at high concentrations, creating a health hazard during operation. Design-level reports would be prepared to document subsurface conditions along the alignment, stations, and project features. Section 4.9, Geotechnical, Subsurface, and Seismic (under the heading "Naturally Occurring Subsurface Gas") provides additional detail on factors that would reduce the risk of gas exposure and intrusion into project structures during operation.

The abandonment of known and undocumented oil/gas wells to current standards would occur during construction and is therefore discussed in Section 4.19.10.2, Construction. Following early detection and proper abandonment (as outlined by Mitigation Measure HAZ-1 [Oil and Gas Wells in Tunnel Areas] and Project Measure HAZ PM-8 [Oil Well Abandonment]), the presence of abandoned oil/gas wells in the Project's footprint and within 100 feet of the Project's footprint during operation of Alternative 1 would not represent a hazard.

Metro has extensively studied methane and H_2S characteristics with respect to their effects on the operation of its rail facilities within Los Angeles County (as described in Section 4.9, Geotechnical, Subsurface, and Seismic, Section 4.9.3.3, under the heading "Naturally Occurring Subsurface Gas"). The following project measures incorporate Metro-specified design measures to address gaseous environments and are required as part of the Project: GEO PM-1 (Geotechnical Design [Operation]), GEO PM-2 (Oil and Gas Zones [Operation]).

Although underground structures would be designed to prevent accumulation of gases, there remains a potential for adverse effects due to the accumulation of hazardous surface gases to occur during operation. The following project measures would also be implemented to identify and reduce potential effects to operators and the public: HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), GEO PM-1 (Geotechnical Design [Operation]), and GEO PM-2 (Oil and Gas Zones [Operation]).

In addition to the project measures noted above, the following mitigation measures would be implemented to prevent an accumulation of methane and further reduce adverse effects: GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), and GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel). With implementation of the project measures and mitigation measures noted above, operation of Alternative 1 would result in no adverse effects related to known or unidentified abandoned wells, hazardous materials, or hazardous subsurface gases.

4.10.3.3 Alternative 2: 7th Street/Metro Center to Pioneer Station

Environmental Concern Sites

Known, Potential, and Historical Concern Sites: There are 634 known, potential, and historical environmental concern sites within the Affected Area for hazards and hazmat of Alternative 2:

- 72 known release sites (27 with contaminated groundwater)
- 127 potential environmental concern sites
- 435 historical environmental concern sites

Disturbance of soil, soil vapor, and groundwater at environmental concern sites is not expected during operation of Alternative 2. Environmental concern site contaminants would therefore not be encountered during operation of Alternative 2. Under NEPA, the operation of Alternative 2 would result in no adverse effects related to environmental concern sites. Due to the consistency in environmental conditions related to environmental concern sites and the proposed length and design of Alternative 2, the potential for effects associated with operation of Alternatives 1 and 2 are generally commensurate.

Landfills: One former landfill (South Gate Rod and Gun Club) with potential soil vapor concerns is located in the Affected Area for hazards and hazmat (landfills) of Alternative 2. As the Affected Area for hazards and hazmat of Alternatives 1 and 2 include the same former landfill, potential effects associated with landfill gases are consistent under these alternatives and the evaluation for Alternative 1 related to methane or other gas accumulation and Mitigation Measure GEO-1 (Hazardous Gas [Operation]) are applicable to Alternative 2. With implementation of GEO-1 (Hazardous Gas [Operation]), operation of Alternative 2 would result in no adverse effects related to landfill gases.

Groundwater Contamination: There are 27 sites with known groundwater contaminants present within the Affected Area for hazards and hazmat of Alternative 2. Although this represents a decrease of three sites when compared to the Affected Area for hazards and hazmat of Alternative 1, the number of sites and design of the Project under these alternatives are generally consistent. Therefore, Alternatives 1 and 2 are commensurate in their potential for effects related to groundwater contamination. The evaluation for Alternative 1 related to groundwater contamination and Project Measure HAZ PM-2 (Disposal of Groundwater [Operation]) are applicable to Alternative 2. With implementation of HAZ PM-2 (Disposal of Groundwater [Operation]), operation of Alternative 2 would result in no adverse effects related to groundwater contamination or dewatering.

General Hazardous Material Conditions

LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, PCBs: The environmental conditions and potential for effects related to the above-listed hazardous materials are consistent across Alternatives 1, 2, 3, and 4. Therefore, the evaluation for Alternative 1 related to LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, and PCBs and Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]) are applicable to Alternative 2. With implementation of these measures, operation of Alternative 2 would result in no adverse effects related to LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, and PCBs.

Educational Facilities

There are 56 educational facilities located within the Affected Area for hazards and hazmat (educational facilities) of Alternative 2. Because Alternatives 1 and 2 cover the same area for most of their length, potential effects to educational facilities as a result of operation are generally consistent between these alternatives. Potential effects to educational facilities are less under Alternatives 3 and 4 because of their shorter length and fewer number of educational facilities within their Affected Area for hazards and hazmat.

The evaluation for Alternative 1 related to hazardous air emissions or extremely hazardous substances or mixtures is applicable to Alternative 2. There are no anticipated emissions or

use of extremely hazardous substances or mixtures within the Affected Area for hazards and hazmat (educational facilities) under Alternative 2. Under NEPA, operation of Alternative 2 would result in no adverse effects related to educational facilities.

Oil and Gas Wells, Fields, and Hazardous Subsurface Gases

Alternative 2 would traverse an area characterized by an abandoned oil field and methane zones, and three abandoned oil wells have been identified within the Affected Area for hazards and hazmat of Alternative 2. Potential effects associated with oil wells and hazardous subsurface gases are generally consistent across Alternatives 1 and 2 and are less under Alternatives 3 and 4, which do not traverse an area where abandoned oil fields and methane zones are present. Due to their consistency in the existing environment related to oil and gas wells, fields, and hazardous subsurface gases, the evaluation for Alternative 1 related to the presence of oil/gas wells and hazardous subsurface gases in the Affected Area for hazards and hazmat of Alternative 1 and the project and mitigation measures are applicable to Alternative 2.

The following project and mitigation measures would be implemented to minimize risks associated with oil wells and methane gas: Mitigation Measures HAZ-1 (Oil and Gas Wells in Tunnel Areas), GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), and GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel), and Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), GEO PM-1 (Geotechnical Design [Operation]), and GEO PM-2 (Oil and Gas Zones [Operation]). With implementation of these project and mitigation measures, effects would be minimized, and operation of Alternative 2 would result in no adverse effects related to oil fields and hazardous subsurface gases.

4.10.3.4 Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Environmental Concern Sites

Known, Potential, and Historical Concern Sites: There are 298 known, potential, and historical environmental concern sites within the Affected Area for hazards and hazmat of Alternative 3:

- 58 known release sites (22 with contaminated groundwater)
- 80 potential environmental concern sites
- 160 historical environmental concern sites

As the number of environmental concern sites is significantly less under Alternative 3 when compared with Alternatives 1 and 2, the potential for effects related to environmental concern sites is less under Alternative 3 than Alternatives 1 and 2. Disturbance of soil, soil vapor, and groundwater at environmental concern sites is not expected during operation of Alternative 3. Therefore, contaminated soil, soil vapor, and/or groundwater at known environmental concern sites would not be encountered during operation of Alternative 3 and operation of Alternative 3 would result in no adverse effects related to environmental concern sites.

Landfills: One former landfill (South Gate Rod and Gun Club) with potential soil vapor concerns is located in the Affected Area for hazards and hazmat (landfills) of Alternative 3. The Affected Area for hazards and hazmat of Alternatives 1, 2, and 3 include the same former landfill. Therefore, potential effects associated with landfill gases are consistent under these alternatives and the evaluation for Alternative 3 related to methane or other gas accumulation and Mitigation Measure GEO-1 (Hazardous Gas [Operation]) are also

applicable to Alternative 3. With implementation of this mitigation measure, operation of Alternative 3 would result in no adverse effects related to landfill gas accumulation.

Groundwater Contamination: There are 22 sites with known groundwater contaminants within the Affected Area for hazards and hazmat of Alternative 3. There are no planned tunnels in Alternative 3. Because Alternative 3 does not include tunnels, the necessity for long-term groundwater dewatering and the associated potential effects are limited when compared to Alternatives 1 and 2. Despite the lack of tunnels, portions of Alternative 3 may require long-term groundwater dewatering, and the evaluation for Alternative 1 related to groundwater contamination and Project Measure HAZ PM-2 (Disposal of Groundwater [Operation]) are applicable to Alternative 3. With implementation of HAZ PM-2 (Disposal of Groundwater [Operation]), operation of Alternative 3 would result in no adverse effects related to groundwater contamination or dewatering.

General Hazardous Material Conditions

LBP, ADL, Asbestos/ACM, Railroad, Pipelines, Agriculture, PCBs: The environmental conditions related to the above-listed hazardous materials are consistent across Alternatives 1, 2, 3, and 4. As Alternative 3 is significantly shorter than Alternatives 1 and 2, the potential for effects to occur is less than under this alternative due to a decreased risk of encountering contaminated soil or groundwater. Despite decreased risk, the evaluation for Alternative 1 related to LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, and PCBs, and Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]) are applicable to Alternative 3. With implementation of these measures, operation of Alternative 3 would result in no adverse effects related to LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, and PCBs.

Educational Facilities

There are 37 educational facilities located in the Affected Area for hazards and hazmat (educational facilities) of Alternative 3. Potential effects to educational facilities are generally consistent across Alternatives 1, 2, 3, and 4. Therefore, the evaluation for Alternative 1 related to hazardous air emissions or extremely hazardous substances or mixtures is also applicable to Alternative 3. Because there are no anticipated emissions or use of extremely hazardous substances or mixtures within 0.25 mile of educational facilities, operation of Alternative 3 would result in no adverse effects related to educational facilities.

Oil and Gas Wells, Fields, and Hazardous Subsurface Gases

Alternative 3 does not traverse an area with an abandoned oil field or methane zone. Therefore, the potential for effects associated with oil fields and hazardous subsurface gases resulting from operation of Alternative 3 is less than under Alternatives 1 and 2. There is, however, one abandoned oil well located in the Affected Area for hazards and hazmat of Alternative 3. Therefore, the evaluation for Alternative 1 related to the presence of known and undocumented oil/gas wells not plugged and abandoned to current standards, remains applicable to Alternative 3. The presence of abandoned oil/gas wells in the Affected Area for hazards and hazmat during operation of Alternative 3 would result in no adverse effects related to oil and gas wells. As Alternative 3 would not pass through an area characterized by abandoned oil fields and methane zones, gaseous conditions are not anticipated, and operation of Alternative 3 would result in no adverse effects related to oil fields and hazardous subsurface gases.

4.10.3.5 Alternative 4: 1-105/C (Green) Line to Pioneer Station

Environmental Concern Sites

Known, Potential, and Historical Concern Sites: There are 79 known, potential, and historical environmental concern sites within the Affected Area for hazards and hazmat of Alternative 4:

- 14 known release sites (8 with contaminated groundwater)
- 27 potential environmental concern sites
- 38 historical environmental concern sites

As Alternative 4 includes the least number of environmental concern sites, operation of Alternative 4 has the least potential (of the four alternatives) for effects associated with environmental concern sites. The disturbance of soil, soil vapor, and groundwater at environmental concern sites is not expected during operation of Alternative 4. Therefore, contaminants associated with environmental concern sites would not be encountered during operation. As a result, operation of Alternative 4 would result in no adverse effects related to environmental concern sites.

Landfills: There are no landfills with soil vapor concerns located within 0.25 mile of the Affected Area for hazards and hazmat (landfills) of Alternative 4. Therefore, operation of Alternative 4 would result in no adverse effects related to landfill gases. The Affected Area for hazards and hazmat of Alternatives 1, 2, and 3 all include 1 former landfill whereas the Affected Area for hazards and hazmat of Alternative 4 includes no former or current landfills. Therefore, potential effects related to landfill gases under Alternative 4 are less than under Alternatives 1, 2, and 3

Groundwater Contamination: There are eight sites with known groundwater contamination present in the Affected Area for hazards and hazmat of Alternative 4. Although there are no planned tunnels in Alternative 4, portions of the Project may be placed in locations where long-term groundwater dewatering is necessary; however, the potential for effects related to groundwater contamination or dewatering are limited when compared to Alternatives 1 and 2. Despite reduced potential for effects, the evaluation for Alternative 1 related to groundwater contamination and Project Measure HAZ PM-2 (Disposal of Groundwater [Operation]) are applicable to Alternative 4. With implementation of HAZ PM-2 (Disposal of Groundwater [Operation]), operation of Alternative 4 would result in no adverse effects related to groundwater contamination or dewatering.

General Hazardous Material Conditions

LBP, ADL, Asbestos/ACM, Railroad, Pipelines, Agriculture, PCBs: The environmental conditions and therefore the potential for effects related to the above-listed hazardous materials are consistent across Alternatives 1, 2, 3, and 4. However, due to its shorter length and lack of proposed tunnels, the potential for effects related to LBP, ADL, Asbestos/ACM, railroad, pipelines agriculture and PCBs is less under Alternative 4 than under Alternatives 1, 2, and 3.

The evaluation for Alternative 1 related to LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, and PCBs and Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]) remains applicable to Alternative 4. With

implementation of these measures, operation of Alternative 4 would result in no adverse effects related to LBP, ADL, Asbestos, Railroad, Pipelines, Agriculture, and PCBs.

Educational Facilities

There are 17 educational facilities located the Affected Area for hazards and hazmat (educational facilities) of Alternative 4. Potential effects to educational facilities are generally consistent across Alternatives 1, 2, 3, and 4. Therefore, the evaluation for Alternative 1 related to hazardous air emissions or extremely hazardous substances or mixtures is applicable to Alternative 4. Under NEPA, operation of Alternative 4 would result in no adverse effects related to educational facilities.

Oil and Gas Wells, Fields, and Hazardous Subsurface Gases

Alternative 4 does not traverse an area with an abandoned oil field or methane zone. Therefore, the potential for effects associated with oil fields and hazardous subsurface gases are significantly less under Alternative 4 (similar to Alternative 3) than Alternatives 1 and 2. There are no known abandoned oil/gas wells within the Affected Area for hazards and hazmat of Alternative 4. However, unidentified abandoned oil/gas wells may be present. Following proper abandonment, the presence of abandoned oil/gas wells in the Affected Area for hazards and hazmat during operation of Alternative 4 would not result in adverse effects related to oil and gas wells. As Alternative 4 would not pass through an area characterized by abandoned oil fields and methane zones, gaseous conditions are not anticipated. Under NEPA, the operation of Alternative 4 would result in no adverse effects related to oil fields and hazardous subsurface gases.

4.10.3.6 Design Options—Alternative 1

Design Option 1: LAUS at MWD

Based on review of Design Option 1 (MWD) and analysis of the existing environment, potential effects associated with operation of this design option would be similar to Alternative 1, as described in Section 4.10.3.2. However, specifically, the Affected Area for hazards and hazmat of Design Option 1 (MWD) contains the following:

- 23 environmental concern sites (one with known contaminated groundwater)
- No landfills
- two educational facilities
- one hazardous material pipeline
- Design Option 1 (MWD) is in an abandoned oil field, methane zone, or methane buffer zone

The potential for effects resulting from construction of Alternative 1 with Design Option 1 (MWD) is generally consistent with those that would result from Alternative 1 without Design Option 1 (MWD). Given the consistency of the existing environment of the hazards and hazmat Affected Area of Design Option 1 (MWD) and Alternative 1, the assessment, project and mitigation measures, and impact conclusions presented in Section 4.10.3.2 are also applicable to Design Option 1 (MWD). With implementation of the following project and mitigation measures, Design Option 1 (MWD) would result in no adverse effects related to environmental concern sites, landfill gases, groundwater contamination, LBP, ADL, Asbestos/ACM, Railroad, Pipelines, Agriculture, PCBs, educational facilities, oil/gas wells, fields, and hazardous subsurface gases: Mitigation Measures HAZ-1 (Oil and Gas Wells in

Tunnel Areas), GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel) and Project Measures: HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), HAZ PM-2 (Disposal of Groundwater [Operation]), HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), GEO PM-1 (Geotechnical Design [Operation]), GEO PM-2 (Oil and Gas Zones [Operation]).

Design Option 2: Add Little Tokyo Station

The potential effects associated with operation of Alternative 1 with Design Option 2 are generally consistent with those associated with Alternative 1 without Design Option 2. The existing environment of the Affected Area for hazards and hazmat of Design Option 2 is consistent with Alternative 1. However, specifically, the Affected Area for hazards and hazmat of Design Option 2 contains the following:

- One environmental concern site (which does not have known contaminated groundwater)
- No landfills
- Four educational facilities
- One hazardous material pipeline
- Design Option 2 is in an abandoned oil field, methane zone, and methane buffer zone

Given the consistency of the existing environment of the hazards and hazmat Affected Area of Design Option 2 and Alternative 1, the assessment, project and mitigation measures, and impact conclusions presented in Section 4.10.3.2 are also applicable to Design Option 2. With implementation of the following project and mitigation measures, Design Option 2 would result in no adverse effects related to environmental concern sites, landfills, groundwater contamination, general hazardous material conditions, educational facilities, oil/gas wells, fields, and hazardous subsurface gases: Mitigation Measures HAZ-1 (Oil and Gas Wells in Tunnel Areas), GEO-1 (Hazardous Gas [Operation]) and GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel), and Project Measures: HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), HAZ PM-2 (Disposal of Groundwater [Operation]), HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), GEO PM-1 (Geotechnical Design [Operation]), GEO PM-2 (Oil and Gas Zones [Operation]).

4.10.3.7 Maintenance and Storage Facility

Paramount MSF Site Option

Environmental Concern Sites

Known, Potential, and Historical Concern Sites: There are nine environmental concern sites within the Affected Area for hazards and hazmat of the Paramount MSF site option, including six known release sites (four with contaminated groundwater) and three potential environmental concern sites (refer to Appendix B in the Hazardous Materials Impact Analysis Report [Appendix S] and Table 4.10.1). Disturbance of soil, soil vapor, and groundwater at known and potential environmental concern sites is not expected during operation of the Paramount MSF site option. Therefore, environmental concern site contaminants would not be encountered during operation of the Paramount MSF site option.

Under NEPA, operation of the Paramount MSF site option would result in no adverse effects related to environmental concern sites.

Landfills: There are no landfills within 0.25 mile of the Paramount MSF site option. Under NEPA, operation of the Paramount MSF site option would result in no adverse effects related to landfill gases.

Groundwater Contamination: Four sites with known groundwater contaminants are present in the Affected Area for hazards and hazmat of the Paramount MSF site option. Portions of the Project associated with the Paramount MSF site option may be placed in locations where long-term groundwater dewatering is necessary. Therefore, the evaluation for Alternative 1, including project measures, would apply to the Paramount MSF site option if groundwater dewatering is required during operation. With implementation of Project Measure HAZ PM-2 (Disposal of Groundwater [Operation]), operation of the Paramount MSF site option would result in no adverse effects related to groundwater contamination or dewatering.

General Hazardous Material Conditions

LBP, ADL, Asbestos/ACM, Railroad, Pipelines, Agriculture, PCBs: Operation of the Paramount MSF site option would not utilize or encounter LBP, ACM, common railroad corridor contaminants, pesticides from agricultural use, ADL, or PCBs. Additionally, although there are four hazardous material pipelines in the Affected Area for hazards and hazmat of the Paramount MSF site option, the pipelines are underground and would not be affected by the aboveground operation of the Paramount MSF site option. Under NEPA, operation of the Paramount MSF site option would result in no adverse effects related to general hazardous material conditions, including hazardous material underground pipelines.

Educational Facilities

There are four educational facilities located within the Affected Area for hazards and hazmat (educational facilities) of the Paramount MSF site option, of which two are immediately adjacent to the Paramount MSF site option. Operation of the maintenance facilities would not emit hazardous air emissions. Mixtures containing extremely hazardous substances would not be used in quantities equal to or greater than the state threshold quantity specified pursuant to subdivision (j) of Section 25532 of the Health and Safety Code. Additionally, Project Measure HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) would be implemented to manage hazardous materials appropriately during operation. With implementation of this measure, operation of the Paramount MSF site option would result in no adverse effects related to educational facilities.

Oil and Gas Wells and Fields, and Hazardous Subsurface Gases

There are no abandoned oil fields, methane zones, or oil/gas wells within the Affected Area for hazards and hazmat of the Paramount MSF site option. Therefore, gaseous conditions and wells are not anticipated. Under NEPA, operation of the Paramount MSF site option would result in no adverse effects related to oil/gas wells, oil fields, and hazardous subsurface gases.

Bellflower MSF Site Option

Environmental Concern Sites

Known, Potential, and Historical Concern Sites: There are three environmental concern sites, all of which are historical environmental concern sites, within the Affected Area for hazards and hazmat of the Bellflower MSF site option. The Affected Area for hazards and hazmat of the Bellflower MSF site option includes fewer environmental concern sites than the Paramount MSF site option. Therefore, the potential for effects related to environmental concern sites is less under the Bellflower MSF site option than the Paramount MSF site option. Disturbance of soil, soil vapor, and groundwater at known and potential environmental concern sites is not expected during operation. Therefore, known and potential environmental concern site contaminants would not be encountered during operation of the Bellflower MSF site option. Under NEPA, operation of the Bellflower MSF site option would result in no adverse effects related to environmental concern sites.

Landfills: No landfills are present within 0.25 mile of the Bellflower MSF site option. Therefore, consistent with the Paramount MSF site option, operation of the Bellflower MSF site option would result in no adverse effects related to landfill gases.

Groundwater Contamination: There are no known groundwater contaminants present within 0.25 mile of the Bellflower MSF site option. Therefore, operation of the Bellflower MSF site option would result in no adverse effects related to groundwater contaminants or dewatering. As the Paramount MSF site option includes four sites with known groundwater contaminants, the potential for effects related to groundwater contamination is greater under the Paramount MSF site option.

General Hazardous Material Conditions

LBP, ADL, Asbestos/ACM, Railroad, Pipelines, Agriculture, PCBs: Operation of the Bellflower MSF site option would not utilize or encounter LBP, ACM, common railroad corridor contaminants, pesticides from agricultural use, ADL, or PCBs. Although there are two hazardous material pipelines in the Affected Area for hazards and hazmat of the Bellflower MSF site option, the pipelines are underground and would not be affected by the aboveground operation of the Bellflower MSF site option. The potential for effects related to LBP, ADL, Asbestos/ACM, railroad, pipelines, agriculture, and PCBs are generally consistent between the Paramount and Bellflower MSF site options. Under NEPA, operation of the Bellflower MSF site option would result in no adverse effects related to general hazardous material conditions, including hazardous material underground pipelines.

Educational Facilities

Two educational facilities are located within the Affected Area for hazards and hazmat (educational facilities) of the Bellflower MSF site option. As this is two fewer than the Paramount MSF site option, the potential for effects to educational facilities associated with the Bellflower MSF site option is less when compared with the Bellflower MSF site option. However, potential effects are consistent among the MSF site options, and the evaluation for the Paramount MSF site option, including implementation of mandatory Project Measure HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), is applicable to the Bellflower MSF site option. With implementation of this project measure, operation of the Bellflower MSF site option would result in no adverse effects related to educational facilities.

Oil and Gas Wells, Fields, and Hazardous Subsurface Gases

The Bellflower MSF site option is not within an area characterized by abandoned oil fields, methane zones, or oil/gas wells. Therefore, gaseous conditions and wells are not anticipated, and operation of the Bellflower MSF site option would result in no adverse effects related to oil/gas wells, oil fields, and hazardous subsurface gases. The potential for effects associated with oil/gas wells, fields, and hazardous subsurface gases are consistent between the Paramount and Bellflower MSF site options.

4.10.4 Project Measures and Mitigation Measures

4.10.4.1 Project Measures

The following project measures have been identified to reduce potential adverse operational effects of the Build Alternatives.

HAZ PM-1 Handling, Storage, and Transport of Hazardous Materials or Wastes (Operation)

During operation of Alternatives 1, 2, 3 and 4, hazardous materials may be temporarily stored, handled, or transported along the alignment, including in the underground train tunnel and underground station areas, and at the MSF. As required by Metro, the operator would provide an industrial waste management plan and/or waste and hazardous materials management plan, such as a plan defined in Title 19 CCR or a Spill Prevention, Control, and Countermeasure Plan prior to the start of revenue service. This plan would identify the responsible parties and outline procedures for hazardous waste and hazardous materials handling, storage, and transport during operation of the Project. The plan would be prepared to Metro Contractor specifications, submitted to Metro, prior to operation, and would be implemented during operation. The plan would:

- Comply with prescribed best management practices (BMPs) to prevent hazardous material releases and cleanup of any hazardous material releases that occur
- Comply with the State Water Resources Control Board (SWRCB) Construction CWA Section 402 General Permit conditions and requirements for transport, labeling, containment, cover, and other BMPs for storage of hazardous materials (SWRCB 2017)

Ground-disturbing activities could occur along the Project if trenches or other soil disturbing activities are needed to maintain or replace the rails or underground rail features or utilities. If ground-disturbing activities occur during operation and undocumented hazardous materials are identified, the operator would comply with the plan identified above for known contaminant sources and applicable federal and state regulations, such as RCRA, CERCLA, the Hazardous Materials Release Response Plans and Inventory Law, and the Hazardous Waste Control Act.

HAZ PM-2 Disposal of Groundwater (Operation)

If disposal of contaminated groundwater is required during operation of Alternatives 1, 2, 3, and 4, (decontamination water, purge water, dewatering, or underground structures [groundwater leakage into the final structure]) is necessary, the LARWQCB would be consulted and the Project would comply with permits as required by the LARWQCB. LARWQCB may require that an individual National Pollutant Discharge Elimination System

(NPDES) permit and/or waste discharge requirements (WDR) be obtained for dewatering and discharge activities. Additionally, the following agencies will be contacted as needed:

- City of Los Angeles Sanitation would be notified if contaminated groundwater will be discharged to the sewer system.
- City of Vernon Health and Environmental Control Department would be contacted if contaminated groundwater will be discharged to the stormwater system.
- County of Los Angeles Department of Public Health would be contacted if contaminated groundwater is encountered during dewatering within the boundaries of the following cities: Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Cerritos, Artesia, and the unincorporated community of Florence-Firestone.

The groundwater discharge and disposal requirements vary by agency, location, concentration, and contaminants of concern and are therefore developed in consultation with the agencies and the project proponent.

HAZ PM-3 Contaminated Soil, Soil Vapor, and Groundwater (Operation)

Prior to the start of project operation of Alternatives 1, 2, 3, and 4, the operator would retain a qualified environmental consultant to prepare a Soil Management Plan, Soil Vapor Management Plan, Soil Reuse Management Plan, and Groundwater Management Plan or a combined Soil, Soil Vapor, Soil Reuse, and Groundwater Management Plan to address the possibility of encountering contaminated soil, soil vapor, and groundwater during project operation. These plans would be completed to Metro's contractor specifications and submitted to Metro prior to operation and any ground-disturbing activities for the Project.

Depending on the overall design of the Project, contaminated soil, soil vapor, and/or groundwater may be encountered during normal operation of the Project (dewatering or soil vapor venting) or during repairs and maintenance along the alignment that involve disturbance of soil, soil vapor, or groundwater (trenching, potholing, and utility repairs).

The Soil and Soil Vapor Management Plans must establish provisions per Metro's contractor specifications for the disturbance of contaminated materials (known and undocumented). Proper management and disposition of contaminated soils and gases would be determined in consultation with appropriate regulatory agencies and in accordance with applicable federal and/or state guidance (USEPA, DTSC, RWQCB, and other local agencies).

The Soil Reuse Management Plan must establish provisions per Metro's contractor specifications for the reuse of contaminated known or undocumented soils. Proper management and disposition of contaminated soils would be determined in consultation with appropriate regulatory agencies and in accordance with applicable federal and/or state guidance (USEPA, DTSC, RWQCB, and other local agencies).

The Groundwater Management Plan must establish provisions per Metro's contractor specifications for encountering and managing contaminated groundwater (known and undocumented). Proper disposal of contaminated groundwater would be determined in consultation with appropriate regulatory agencies and in accordance with applicable federal and/or state guidance (USEPA, DTSC, RWQCB, and other local agencies).

Where open or closed regulatory release cases are already managed by a regulatory agency (e.g., USEPA, DTSC, RWQCB) and Metro's operation involves plans to alter the use of the

site and/or disturb contaminated soil and/or groundwater onsite, Metro would notify the regulatory agency of the planned land use changes prior to ground-disturbing activities at the location of the open or closed regulatory release site. The regulatory agency would determine the level of investigation and/or remediation (performance standards) necessary on a case by case basis. A closure or no further action determination letter from the regulatory agency would be obtained when investigation and/or remediation is complete.

4.10.4.2 Mitigation Measures

There are no hazardous material mitigation measures required during operation of the Build Alternatives, including design options and MSF site options. The following four geotechnical mitigation measures, which are described in Section 4.9.4.2 of the Geotechnical, Subsurface, and Seismic Section, are applicable to subsurface gases:

- GEO-1 Hazardous Gas (Operation)
- GEO-2 Structural Design
- GEO-3 Gas Monitoring (Operation)
- GEO-4 Tunnel Advisory Panel

Mitigation Measure GEO-1 is applicable to Alternatives 1, 2, and 3. Mitigation Measures GEO-3 and GEO-4 are specific to Alternatives 1 and 2.

4.10.5 California Environmental Quality Act Determination – Operation

The hazards and hazardous materials CEQA determinations included in the following sections are based on the existing conditions presented in Section 4.10.2, the environmental impacts analysis presented in Section 4.10.3, and the project measures and mitigation measures identified in Sections 4.10.4.1 and Section 4.9.4 of the Geotechnical, Subsurface, and Seismic Section.

4.10.5.1 Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

No Project Alternative

Under the No Project Alternative, there would be no change to the Affected Area for hazards and hazmat. Therefore, the No Project Alternative would not result in significant impacts and mitigation would not be required. However, pre-existing contaminated areas that would be remediated under the Build Alternatives (which is a residual benefit of project implementation) would also not occur. Therefore, the No Project Alternative would not provide the potential long-term site remediation benefits of the proposed project.

Alternatives 1, 2, 3 and 4

Operation of Alternatives 1, 2, 3, and 4 would not result in the routine transport, use, or disposal of hazardous materials or wastes. Therefore, impacts related to the routine transport, use, or disposal of hazardous materials during operation of Alternatives 1, 2, 3, and 4 would be less than significant.

If long-term groundwater monitoring or future maintenance of the Project requires soil disturbance during operation, potentially significant impacts may occur. However, required Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation], HAZ PM-2 (Disposal of Groundwater [Operation], and HAZ PM-3

(Contaminated Soil, Soil Vapor, and Groundwater [Operation]) would result in the appropriate management of hazardous materials, affected groundwater, and contaminated soil during operation. With implementation of these project measures, potential significant hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials during operation of Alternatives 1, 2, 3, and 4 would be less than significant.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: The analysis presented for Alternative 1, including project measures, would also apply to Design Options 1 and 2; therefore, impacts would be less than significant.

Maintenance and Storage Facility

Paramount MSF Site Option: Operation of the Paramount MSF site option may involve storage of hazardous materials and wastes for maintaining and repairing rail equipment. Hazardous materials and wastes and storage equipment could include wash racks and storage tanks for fuel, lubricants, used oils, paints, coatings, and various solvents. However, operation of the MSF is not expected to include the use of extremely hazardous materials.

Past known site uses in the southern portion of the proposed MSF site option include hazardous materials usage and waste generation. The northern portion is currently occupied by a swap meet/drive-in that uses small amounts of household hazardous materials and typically does not generate large quantities of hazardous materials or wastes. Based on the location of the proposed facility within an area characterized by existing commercial, industrial, and educational uses, the public and the environment would be exposed to an increase in the use, storage, transport, or handling of hazardous materials in the vicinity due to operation of the Paramount MSF site option.

Compliance with existing federal regulations pertaining to hazardous material handling, transport, and disposal and required by Project Measure HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) would manage hazardous materials appropriately during operation. With implementation of this project measure, hazards potentially significant to the public or the environment through the routine transport, use, or disposal of hazardous materials during operation of the Paramount MSF site option would be less than significant.

Bellflower MSF Site Option: Operation of the Bellflower MSF site option is not expected to include the use of extremely hazardous materials. However, operation of the facility may involve the storage of hazardous materials and wastes for maintaining and repairing rail (similar to the Paramount MSF site option). The proposed location of the Bellflower MSF site option is currently occupied by a paintball and airsoft park, which does not generate large quantities of hazardous materials or wastes. Therefore, the public and environment would be exposed to an increase in the use, storage, transport, and/or handling of hazardous materials due to operation of the Bellflower MSF site option (similar to the Paramount MSF site option).

Compliance with existing regulations pertaining to hazardous material handling, transport, and disposal and required by Project Measure HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) would manage hazardous materials appropriately during operation. With implementation of this project measure, potential significant hazards to the public or environment through the routine transport, use, or

disposal of hazardous materials during operation of the Bellflower MSF site option would be less than significant.

4.10.5.2 Would the Project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

No Project Alternative

The No Project Alternative would not result in impacts related to the release of hazardous materials into the environment because no new operational activities are proposed that would alter existing conditions.

Alternatives 1 and 2

Operation of Alternatives 1 and 2 would not involve the transport, storage, use, or disposal of hazardous materials in quantities greater than needed to support standard operations, and impacts would not occur. If future maintenance involving soil disturbance is necessary during operation of the Project, residual contamination present in onsite soils may create a significant hazard to the public or environment due to reasonably foreseeable upset and accident conditions involving the release of hazardous materials during soil disturbance; this would be considered potentially significant. Additionally, tunnels proposed as part of the Project would be operated in areas with gaseous soil conditions. If a train accident were to cause a release of subsurface gases to a tunnel, it may create a significant hazard to the public or environment due to reasonably foreseeable upset and accident conditions involving the release of hazardous materials; this would also be considered potentially significant.

Although tunnel venting and the storage, handling, and transportation of hazardous materials would be subject to existing federal regulations, the following project measures would also be implemented: HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), and GEO PM-2 (Oil Fields, Methane Zones, and Methane Buffer Zones [Operation]). While impacts would be reduced due to implementation of these project measures, they would remain potentially significant and the following mitigation measures would be required: GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), and GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel). With implementation of the project and mitigation measures noted above, potential impacts resulting from operation of Alternatives 1 and 2 would be less than significant.

Mitigation Measures: GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel) would be required. Implementation of these mitigation measures would mandate the design of an adequate ventilation system to dilute and transport gases out of tunnels during operation, reduce emission impacts to educational facilities and the public, provide guidelines for managing contaminated soil, soil vapor, and groundwater, and provide emergency response procedures.

Impacts Remaining After Mitigation: Less than significant.

Alternatives 3 and 4

Operation of Alternatives 3 and 4 would not result in impacts from reasonably foreseeable upset and accident conditions. Under these alternatives, the Project does not include underground tunnels or features. Because underground tunnels or features are not included,

operation of Alternatives 3 and 4 would not involve continuous air monitoring or venting and impacts would not occur.

If future maintenance involving soil disturbance is necessary during operation of Alternatives 3 and 4, residual contamination present in onsite soils may create a significant hazard to the public or environment due to reasonably foreseeable upset and accident conditions involving the release of hazardous materials during soil disturbance; this would be considered potentially significant.

In the event that soil disturbance is necessary during operation, Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]) would be implemented to identify and reduce potential contaminated soil disturbance impacts. With implementation of HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) and HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), impacts would be less than significant, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Operation of Design Options 1 and 2 would result in impacts similar to those described above for Alternative 1. The evaluation, project measures, and mitigation measures identified for Alternative 1 related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment are also applicable to Design Options 1 and 2. With implementation of Project Measures HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), HAZ PM-3 (Contaminated Soil, Soil Vapor, and Groundwater [Operation]), and GEO PM-2 (Oil and Gas Zones [Operation]) and Mitigation Measures GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation])and GEO-4 (Tunnel Advisory Panel), potential significant hazards related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be less than significant during operation of Design Options 1 and 2.

Mitigation Measures: GEO-1 (Hazardous Gas [Operation]), GEO-2 (Structural Design), GEO-3 (Gas Monitoring [Operation]) and GEO-4 (Tunnel Advisory Panel) would be required. Implementation of these measures would mandate the design of an adequate ventilation system to dilute and transport gases out of tunnels during operation, reduce emission impacts to educational facilities and the public, provide guidelines for managing contaminated soil, soil vapor, and groundwater, and provide emergency response procedures.

Impacts Remaining After Mitigation: Less than significant.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: Operation of the Paramount and Bellflower MSF site options is not expected to include the use of extremely hazardous materials. However, operation of the site options may involve storage of hazardous materials and wastes for maintaining and repairing rail equipment. Hazardous materials and wastes and storage equipment may include wash racks and storage tanks for fuel, lubricants, used oils, paints, coatings, and various solvents, which would likely be classified as hazardous substances or materials and wastes. Misuse of the hazardous materials or unintended releases of the hazardous materials may result in personnel or public exposure to hazardous materials.

Therefore, the use of hazardous materials onsite may create a significant hazard to the public or the environment due to reasonably foreseeable upset and accident conditions involving the release of hazardous materials; these risks would be considered potentially significant.

The storage, handling, and transportation of hazardous materials at the Paramount and Bellflower MSF site options would be subject to existing federal regulations pertaining to hazardous material handling, transport, and disposal, as required by Project Measure HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]). Implementation of HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) would minimize the risk of exposure of the public or environment during operation of either MSF site option. Risks would be less than significant, and mitigation would not be required.

4.10.5.3 Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Project Alternative

Under the No Project Alternative, the Project would not be implemented. Therefore, no direct impacts associated with hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school would occur. However, the benefit of remediating sites with pre-existing hazardous conditions as a result of the Project would also not occur. Therefore, the No Project Alternative would provide no potential long-term site remediation benefits.

Alternatives 1 and 2

Operation of Alternatives 1 and 2 would not result in hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school during operation. There are 53 educational facilities located within the Affected Area for hazards and hazmat (educational facilities), 10 of which are within the Affected Area for hazards and hazmat (educational facilities) of the Alternative 1 tunnel. There are 56 educational facilities within the Affected Area for hazards and hazmat of Alternative 2, 18 of which are in the Affected Area for hazards and hazmat (educational facilities) of the Alternative 2 tunnel. Metro does not anticipate the handling of hazardous or acutely hazardous materials, substances, or waste during operation of Alternatives 1 and 2. Therefore, impacts would be less than significant.

Additionally, although methane and H_2S gases would be present in the soils surrounding the tunnels, per Metro's contractor specifications, tunnels would be designed and constructed to include passive venting to the atmosphere and prevent gaseous intrusion into the tunnels during operation. As there would be no hazardous air emissions during operation, impacts would be less than significant.

Alternatives 3 and 4

Operation of Alternatives 3 and 4 would not result in hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within the Affected Area for hazards and hazmat (educational facilities) during operation (similar to Alternative 1). There are 37 educational facilities located within the Affected Area for hazards and hazmat (educational facilities) of Alternative 3 and 17 educational facilities located within the

Affected Area for hazards and hazmat (educational facilities) of Alternative 4. There are no tunnels planned for Alternatives 3 and 4 and Metro does not anticipate emitting hazardous materials or handling of hazardous or acutely hazardous materials, substances, or waste during operation of Alternatives 3 and 4. Therefore, impacts would be less than significant.

Design Options—Alternative 1

Design Option 1: LAUS at MWD: Operation of Design Option 1 (MWD) would not result in hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school during operation (similar to Alternative 1). There are 2 educational facilities located within the Affected Area for hazards and hazmat (educational facilities) of Design Option 1 (MWD), both of which are present within the Affected Area for hazards and hazmat (educational facilities) of the Design Option 1 (MWD) tunnel.

Metro has indicated that they do not anticipate the handling of hazardous or acutely hazardous materials, substances, or waste during operation of Design Option 1 (MWD). Therefore, impacts would be less than significant. Additionally, although methane and H_2S gases would be present in the soils surrounding the tunnels, per Metro's contractor specifications the tunnels would be designed and constructed in a manner that would include passive venting to the atmosphere and prevent gaseous intrusion into the tunnels during operation. Since there would be no hazardous air emissions during operation, impacts would be less than significant (similar to Alternative 1).

Design Option 2: Add Little Tokyo Station: Operation of Design Option 2 would not result in hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school during operation (similar to Alternative 1). There are four educational facilities located within the Affected Area for hazards and hazmat (educational facilities) of Design Option 2, all of which are within the Affected Area for hazards and hazmat (educational facilities) of the Design Option 2 tunnels. Metro does not anticipate the handling of hazardous or acutely hazardous materials, substances, or waste during the operation of Design Option 2. Therefore, impacts would be less than significant (similar to Alternative 1).

Additionally, although methane and H_2S gases would be present in the soils surrounding the tunnels, per Metro's contractor specifications tunnels would be designed and constructed to include passive venting to the atmosphere and prevent gaseous intrusion into the tunnels during operation. This would result in no hazardous air emissions during operation and impacts would be less than significant.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: Two educational facilities are located within the Affected Area for hazards and hazmat (educational facilities) of the Paramount MSF site option, two of which are immediately adjacent to the Paramount MSF site option. Three of these educational facilities are also located within the Affected Area for hazards and hazmat (educational facilities) of Alternatives 1, 2, 3, and 4. Two educational facilities are located within the Affected Area for hazards and hazmat (educational facilities) of the Bellflower MSF site option, both of which are within the Affected Area for hazards and hazmat (educational facilities) of Alternatives 1, 2, 3, and 4.

Operation of the Paramount and Bellflower MSF site option is not expected to include the use of extremely hazardous materials. Metro has indicated that the use of cleaners and degreasers that could contain small amounts of hazardous or acutely hazardous materials, substances, or wastes may occur during operation of the Paramount and Bellflower MSF site options. However, off-the-shelf products would be used and exposure outside the facility would be unlikely.

Operation of the Paramount and Bellflower MSF site options would involve handling limited quantities of mixtures containing small amounts of hazardous or acutely hazardous materials, substances, or wastes during operation within one-quarter mile of an existing or proposed school. Therefore, potentially significant impacts are present. Project Measure HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]) would be implemented in situations where educational facilities are located within 0.25 mile of either MSF to manage hazardous materials appropriately during operation. With implementation of HAZ PM-1 (Handling, Storage, and Transport of Hazardous Materials or Wastes [Operation]), impacts would be less than significant.

4.10.5.4 Would the Project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Project Alternative

No changes would occur to the Affected Area for hazards and hazmat under the No Project Alternative. Therefore, impacts would be less than significant.

Alternatives 1, 2, and 3

Three hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Cortese sites) are located in or partially in the Affected Area for hazards and hazmat of Alternatives 1, 2, and 3. Although these alternatives would not operate within a Cortese site, operation of the Project would occur on other regulatory-listed sites, including a landfill, with hazardous material impacts in the soil, soil vapor, and/or groundwater. Affected soil, soil vapor, and groundwater associated with these release sites may be present beneath the Project; however, operation of the Project would not disturb the soil, soil vapor, or groundwater. As a result, impacts would be less than significant, and mitigation would not be required.

Alternative 4

No Cortese sites are located in or partially in the Affected Area for hazards and hazmat of Alternative 4. However, operation of Alternative 4 would occur on other sites with soil, soil vapor, and contaminated groundwater. Although affected soil, soil vapor, and groundwater associated with these release sites may be present beneath the Project, operation of the Project would not involve disturbance of the soil; thus, impacts would be less than significant, and mitigation would not be required (similar to Alternative 1).

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Neither of the design options would be constructed directly within a Cortese site. However, operation of the design options would occur on other regulatory-listed sites with hazardous material impacts in the soil, soil vapor, and/or groundwater. Although contaminated soil, soil vapor, and groundwater associated with these release sites may be present beneath the Project, operation of the Project

would not disturb the soil, soil vapor, or groundwater. Impacts would therefore be less than significant and mitigation would not be required (similar to Alternative 1).

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: Neither MSF would be constructed directly within a Cortese site. However, operation of the MSFs would occur on historical concern sites and other regulatory-listed sites with hazardous material impacts in the soil, soil vapor, and/or groundwater. Although contaminated soil, soil vapor, and groundwater associated with these release sites may be present beneath the Paramount and Bellflower MSF site options, operation of the Paramount and Bellflower MSF site options would not disturb soil, soil vapor, or groundwater. Impacts would therefore be less than significant and mitigation would not be required (similar to Alternative 1).

4.10.5.5 For a Project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard or excessive noise for people residing or working in the Project area?

No airport hazards would occur under the No Project Alternative. There are no airports located within 2 miles of Alternatives 1, 2, 3, and 4, Design Options 1 and 2, or the Paramount or Bellflower MSF site option. Therefore, no impact related to safety hazards at airports would occur from operation of the Project.

4.10.5.6 Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The CEQA determinations for this threshold are discussed in Section 4.18.5, Safety and Security, of this Draft EIS/EIR and Section 6.1 of *the West Santa Ana Branch Transit Corridor Project Final Safety and Security Impact Analysis Report* (Metro 2021c) (Appendix F).

4.10.5.7 Would the Project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

No wildland fire hazards would occur under the No Project Alternative. No wildlands are located in the vicinity of Alternatives 1, 2, 3, and 4, Design Options 1 and 2, or the Paramount or Bellflower MSF site options. Therefore, no impact would occur from operation of the Project.

4.11 Water Resources

This section summarizes the current applicable regulatory setting, existing conditions, and potential impacts to water resources from the Build Alternatives, including design options and MSF site options. Specifically, this section discusses hydrology and surface waters, water quality, floodplains, and groundwater. Additional information on water resources is provided in the *West Santa Ana Branch Transit Corridor Project Final Water Resources Impact Analysis Report* (Metro 2021d), included as Appendix T to this Draft EIS/EIR.

4.11.1 Regulatory Setting and Methodology

4.11.1.1 Regulatory Setting

The following subsections summarize the regulatory context under which water resources are managed at the federal, state, regional, and local levels, and the statutes (ordinances, policies, and codes) that provide regulatory structure.

Federal

The following federal regulations are applicable to the Project:

- **Clean Water Act (CWA) (U.S.C. Title 33, Section 1251 et seq.):**
  - **Section 404:** The USACE has jurisdiction over all Waters of the U.S., which include navigable waters and traditionally navigable waters as defined in Title 33, Part 328.3(a) of the Code of Federal Regulations. Under the CWA Section 404, the USACE regulates the discharge of dredged or fill materials (including from construction activities) into Waters of the U.S.; the Waters of the U.S. potentially affected by the Project are the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River.
  - **Section 303(d):** The USEPA has authority under the CWA to implement water pollution control programs. In California, this authority is delegated to the SWRCB. Section 303(d) requires states to develop a list of water-quality-impaired water bodies and to implement total maximum daily loads (TMDLs) for certain pollutants in order to meet water quality standards.
- **Rivers and Harbors Act of 1899 (33 U.S.C. 403 and 408):** The USACE has jurisdiction over flood protection systems under Section 14 of the Rivers and Harbors Act (33 U.S.C. Sections 403 and 408). Construction and operation of the Build Alternatives in the Los Angeles River, the Rio Hondo Channel, or the San Gabriel River channel would require review and approval by the USACE through a Section 408 permit.
- **Executive Orders 11988 and 13690: Floodplain Management:** All federal agencies must avoid (to the extent possible) long- and short-term adverse effects associated with the occupancy or modification of floodplains. The Executive Orders establish an eight-step process that agencies should carry out as part of the decision-making process on projects with the potential to impact floodplains. Engineer Regulation 1165-2-26 describes how the USACE implements Executive Order 11988 to: avoid development in a floodplain unless it is the only practicable alternative; reduce the hazard and risk associated with flooding; minimize the impacts of floods on human health, safety, and welfare; and restore the beneficial values of floodplains. Executive

Order 13690 amends Executive Order 11988 to establish a federal flood risk management standard and a process for soliciting and considering stakeholder input.

- **National Flood Insurance Act (42 U.S.C. 4001 et seq.)**: The Federal Emergency Management Agency (FEMA) issues flood zone maps on a countywide level. 44 CFR 59-65 set the National Flood Insurance Program (NFIP) floodplain management building requirements delineating policies for development in floodplains. Among other provisions, applicable aspects of the NFIP regulations state that if the area of construction is located within a regulatory floodway, as delineated on the Flood Insurance Rate Map, any development must not increase base flood elevation levels. The term "development" means any man-made change to improved or unimproved real estate, including, but not limited to, buildings, other structures, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials. A hydrologic and hydraulic analysis must be performed prior to the start of development and must demonstrate that the development would not cause any rise in base flood levels.
- **Fish and Wildlife Coordination Act:** The Fish and Wildlife Coordination Act requires federal agencies to consult with the U.S. Fish and Wildlife Service and, in some instances, with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, and with state fish and wildlife resource agencies (such as the CDFW) before undertaking or approving water projects that would control or modify surface water. Consultation provides equal consideration to the wildlife concerns amidst the development of water resource projects and are coordinated with the features of these projects. Federal agencies are required to fully consider these agencies' recommendations in project reports and to include measures to reduce impacts on fish and wildlife in project plans.

State

The SWRCB and the nine RWQCBs are responsible for the protection of water quality in the state. The SWRCB establishes statewide policies and regulations mandated by federal and state water quality statutes and regulations.

Projects resulting in water discharges, whether to land or water, are subject to Section 13263 of the California Water Code. Through the mandates of this section, dischargers are required to comply with WDRs as developed by the RWQCB. The Project could produce stormwater and other discharges during construction and operation, and therefore would be regulated by the SWRCB and the LARWQCB. The Project would also be subject to additional state regulations related to water resources, including:

- **CWA Section 401:** The SWRCB has jurisdiction over all Waters of the U.S. within California, including the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River. Under CWA Section 401, the SWRCB must issue a 401 Water Quality Certification to achieve compliance with state water quality standards for any activity resulting in a discharge to a water body, including the placement of structures in the rivers and/or spreading basins in the Affected Area.
- **Section 402 (NPDES)**: Through delegated jurisdiction under the CWA, the SWRCB regulates point-source discharges to Waters of the U.S. under the NPDES. Regulated discharges also include diffuse sources of discharge caused by general construction activities covering an area greater than 1 acre, and stormwater discharges in municipal separate storm sewer systems (MS4s) in which runoff is carried through a developed conveyance system to specific discharge locations. The SWRCB issues both

a construction general permit for protection of water quality from stormwater discharges during construction activities, and an industrial general permit for protection of water quality from stormwater discharges during industrial activities. Under construction and operation of the Build Alternatives, Metro would be responsible for compliance with both of these NPDES permits.

- **Porter-Cologne Water Quality Control Act**: The Act authorizes the SWRCB to adopt, review, and revise policies for all waters of the state (including both surface and groundwater); regulates discharges to surface water and groundwater; and directs the RWQCBs to develop regional basin plans.
- **CDFW Code Section 1602:** The CDFW has jurisdiction over ephemeral, intermittent, and perennial waterways, including natural lakes and man-made reservoirs. CDFW's jurisdiction can also extend over the habitats adjacent to waterways. Under Section 1602, CDFW must be notified of any activity that substantially diverts or obstructs a waterway; changes or uses material from the bed, channel, or bank of a waterway; or deposits or disposes of debris, waste, or other material containing ground pavement where it may pass into any waterway. Notification of CDFW (through a Lake or Streambed Alteration Agreement) would be required prior to the start of construction.
- **State Antidegradation Policy**: This policy is enforced by the SWRCB to maintain high-quality waters in California. The policy requires that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge into high-quality waters will be required to meet WDRs to control the discharge and to avoid any pollution or nuisance from occurring.
- **Construction General NPDES Permit (CGP)**: This permit is enforced by the SWRCB to minimize impacts to stormwater during construction. The CGP requirements apply to any construction project that either results in the disturbance of at least 1 acre of land or is part of a larger common development plan. Additionally, the CGP is required for related construction or demolition activities, including clearing, grading, grubbing, or excavation, or any other activity that results in greater than 1 acre of land disturbance.
- **Industrial General NPDES Permit (IGP)**: This permit is enforced by the SWRCB to minimize impacts to stormwater from industrial activities. The Project would be subject to the regulations of the IGP because it is a transportation facility with vehicle maintenance shops and equipment cleaning operations. The Local and Suburban Transit (4111) Standard Industrial Classification Code is applicable to the Project and regulated by the IGP. The IGP requires preparation of an industrial stormwater pollution prevention plan (SWPPP) and a monitoring plan for industrial facilities, including vehicle maintenance facilities associated with transportation operations.
- **Seismic Regulations**: Under jurisdiction of the California Department of Conservation, Geological Survey, the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazards Mapping Act regulate the construction and protection of structures used for human occupancy on the surface trace of active faults and on nonsurface active fault ruptures, respectively. State seismic regulations relate to water quality due to potential hazards related to dam failure and inundation caused by earthquake-induced ground shaking or a seiche event, erosion, improper siting and/or design, and rapidly rising floodwaters during heavy storm events.
- **Sustainable Groundwater Management Act (SGMA):** This is enforced by the California DWR for the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results

(DWR 2019a). SGMA requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. SGMA empowers local agencies to form groundwater sustainability agencies (GSAs) to manage basins sustainably and requires those GSAs to adopt groundwater sustainability plans for crucial groundwater basins in California (DWR 2019b). Water Code Section 10720.8 identifies adjudicated areas in SGMA, which have an existing defined entity administering the adjudication. Under SGMA, adjudicated portions of basins are exempt from developing a Groundwater Sustainability Plan and forming a GSA. However, the entities administering the adjudications are subject to submitting annual reports. The Central Groundwater Basin lies beneath the project site. It is adjudicated and managed by the Water Replenishment District of Southern California (WRD).

Regional

The LARWQCB has jurisdiction over stormwater and urban runoff discharges from 84 incorporated cities within the Los Angeles County Flood Control District (LACFCD), including the cities in the Affected Area for water resources. This Project is expected to incur construction-related discharges to various downstream water bodies. Therefore, construction and operation of the Build Alternatives would be regulated by:

- LA County MS4 Permit (LARWQCB Order No. R4-2012-0175 as amended by SWRCB Order No. WQ 2015-0075, LARWQCB Order No. R4-2012-0175-A01, NPDES Permit No. CAS004001, and LA County MS4 NPDES permit). This permit regulates the LACFCD, the County of Los Angeles, and 84 incorporated cities within the LACFCD (including the cities in the Affected Area for water resources) for discharges of stormwater and urban runoff from MS4s, also called storm drainage systems. The LA County MS4 NPDES permit requires new development and redevelopment projects to have post-construction controls to manage pollutants, pollutant loads, and runoff volume emanating from the project site.
- LARWQCB Order No. R4-2013-0095 (NPDES No. CAG994004), Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties (Construction Dewatering Permit) is required for discharges to surface water from dewatering activities.
- LARWQCB Order No. 93-010, Waste Discharge Requirements for Specified Discharges to Groundwater in the Santa Clara River and Los Angeles River Basins covers construction dewatering and dust control application. The WDR requires that wastewater be analyzed prior to being discharged to determine if it contains pollutants in excess of the applicable Basin Plan Water Quality Objectives. Additionally, any wastewater that might be encountered and subsequently discharged to groundwater will need to comply with applicable water quality standards.
- LARWQCB Order No. 91-93, Waste Discharge Requirements for Discharge of Non-Hazardous Contaminated Soils and Other Wastes in Los Angeles River and Santa Clara River Basins protects waters of the state from contamination due to disposal of soils containing moderate concentrations of petroleum hydrocarbons, heavy metals, and other wastes.
- *Water Quality Control Plan, Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (LARWQCB 1995). This plan sets forth the regulatory water quality standards for surface waters and groundwater within the region.

In addition to the regional regulations set forth by the LARWQCB, various local ordinances and policies regulate construction and operational stormwater discharges, and/or project design impacts to water resources. The Project would also be subject to the following LA County plans and policies:

- LA County *General Plan* (LA County 2015)
- LA County Code (LA County 1998)
- *A Common Thread Rediscovered – San Gabriel River Corridor Master Plan* (LACDPW 2006) and the *Los Angeles River Master Plan* (LACDPW et al. 1996)
- General Management Water Use and Conservation Policy Statement (Metro 2009b)

Local

The Project traverses 12 local jurisdictions: the Cities of Los Angeles, Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Artesia, and Cerritos, and the unincorporated Florence-Firestone community of LA County. As such, the Project would be subject to the applicable general plan policies and municipal code ordinances within each jurisdiction (see Table 3.1 in the Water Resources Impact Analysis Report [Appendix T]). These plans and regulations set out policies and guidelines pertaining to water use, water quality, and floodplains. Some local approvals may be required; however, no specific permits are required by city codes and regulations.

4.11.1.2 Methodology

The methodology for the evaluation of impacts to water resources involves an analysis of existing data related to hydrology, flooding, drainage, and water quality, and an assessment of whether the Project would substantially degrade surface water or groundwater quality; alter drainage patterns in a manner that would cause flooding, erosion, or siltation; result in exposure of people and/or property to water-related hazards; or otherwise conflict with applicable laws related to hydrology and water quality. The Affected Area for water resources includes the area within 500 feet of the construction footprint. Impact significance, according to CEQA, is determined by comparing project impacts to the CEQA Appendix G thresholds, as summarized in Section 4.11.5.

Permanent impacts to water resources are evaluated by estimating the conversion of pervious to impervious surfaces. Conversion of pervious to impervious areas decreases infiltration, which increases the concentration and total pollutant load in stormwater runoff by increasing runoff volume and peak flow rates. Impacts to water quality from rail operations can be quantified based on the length of track because the track operations areas generate and discharge these pollutants in stormwater as nonpoint source pollution. As pollution generation rates caused by operations are generally similar along the Project's guideway alignment, the length of track is therefore a useful way to evaluate and compare Build Alternatives for their magnitude, quality, and location of potential water quality impacts. Construction impacts to water resources are evaluated by estimating the total disturbance area during project construction. Construction would involve ground disturbance (e.g., excavation, stockpiling, and grading) that would expose bare soils to stormwater and could lead to erosion and sedimentation. The results of the construction analysis are included in Section 4.19.3.11, Construction Impacts, Mitigation Measures, and CEQA Determination, of this Draft EIS/EIR.

4.11.2 Affected Environment/Existing Conditions

4.11.2.1 Hydrology and Surface Water Bodies

The water resources Affected Area for the Build Alternatives would be located within the watersheds of the Los Angeles River, the San Gabriel River, and Ballona Creek, along with the watersheds of their major tributaries, including the Rio Hondo Channel, Compton Creek, the Los Cerritos Channel, and Coyote Creek. The proposed alignments for Alternatives 1, 2, and 3 would cross the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River at existing railroad bridge crossings. Alternative 4 would cross the San Gabriel River only.

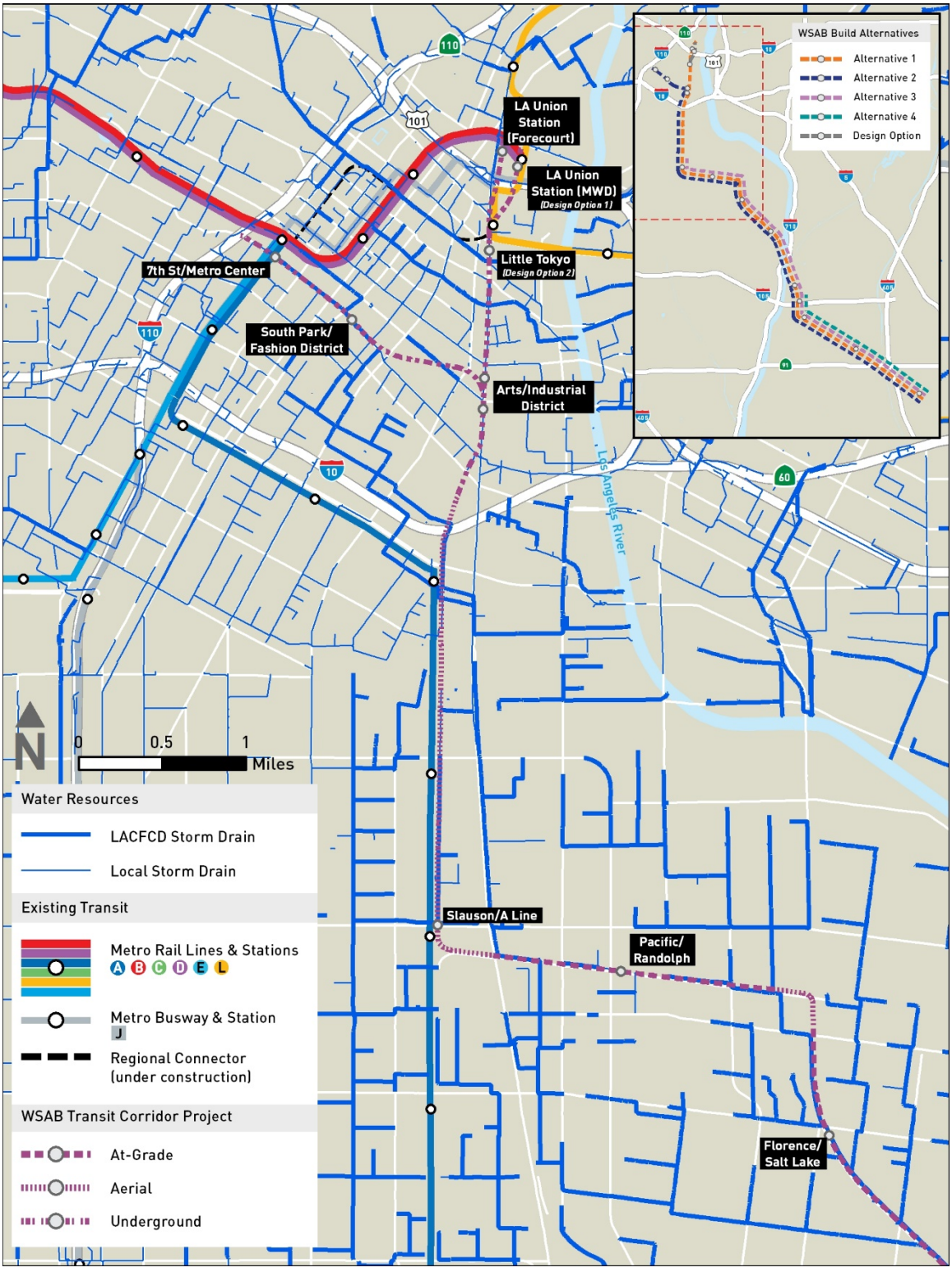
The Build Alternatives are located within the coastal plain of LA County, which is generally flat with mild slopes draining south to southwest toward the ocean. The storm drainage system that exists today generally mirrors the historic locations of rivers and tributaries in the watersheds. Many of the original natural drainages have been engineered to serve as storm drainage for the LACDPW (LACDPW 2006). Land in the Affected Area for water resources is urbanized and largely covered with impervious surfaces associated with areas of asphalt, concrete, buildings, and other land uses that concentrate storm runoff. The Build Alternatives are primarily along major roadway arterials or rail corridors with existing drainage infrastructure. Figure 4.11-1 shows the location of major flood-control channel crossings, including the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River. Throughout the Affected Area for water resources, stormwater and other surface water runoff is conveyed to municipal storm drains that eventually drain to the surface waters, as shown on Figure 4.11-2 and Figure 4.11-3.

Ownership and maintenance of the storm drainage infrastructure varies among the local jurisdiction, LACFCD, and the California Department of Transportation. Although USACE and LACFCD share jurisdiction over the Los Angeles River and the San Gabriel River, locations of all potential river crossings are within LACFCD jurisdiction.

Figure 4.11-1. Hydrology and Surface Water Bodies

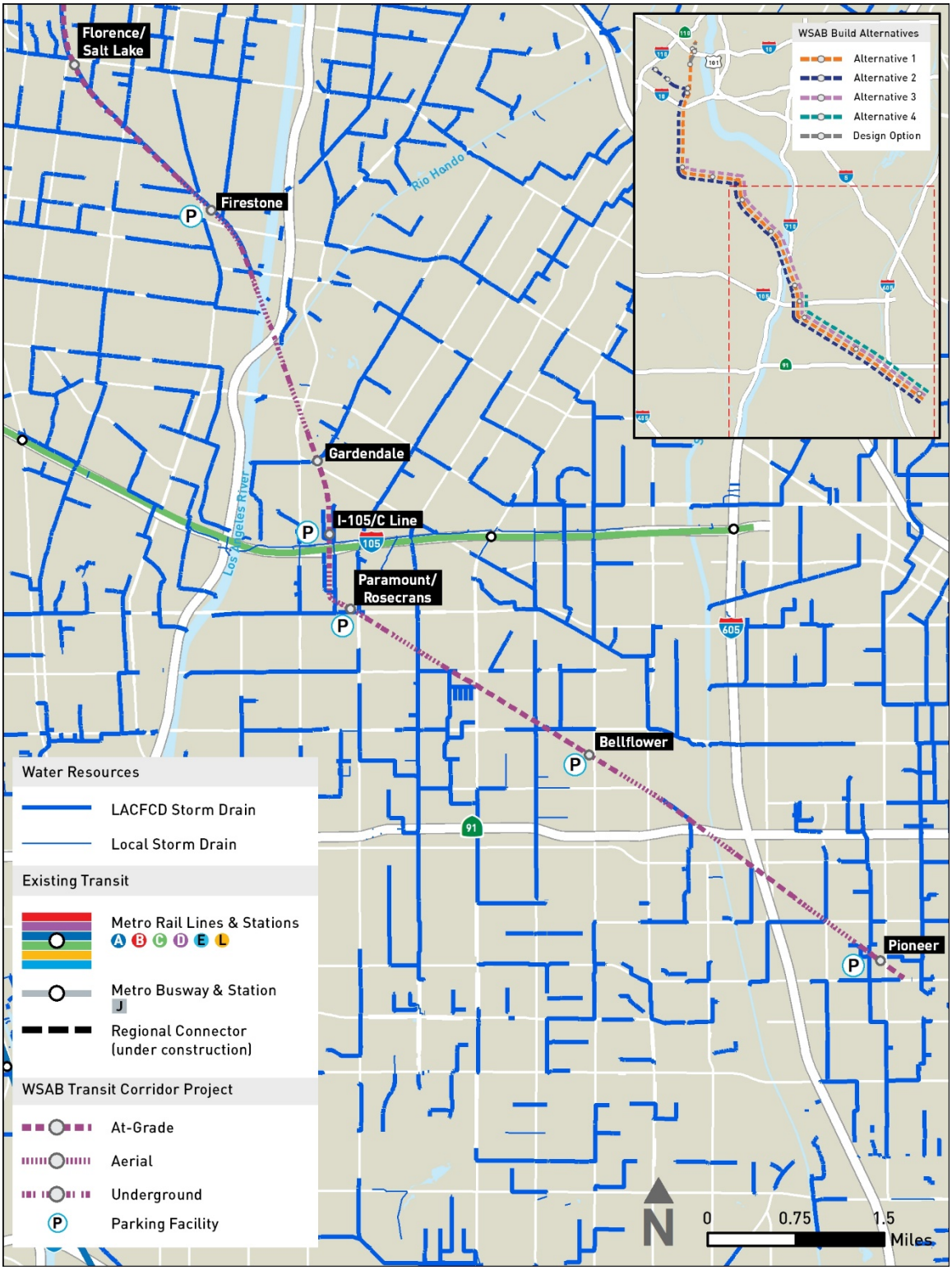
Source: Metro 2021d

Figure 4.11-2. Regional Storm Drain System (1 of 2)



Source: Metro 2021d

Figure 4.11-3. Regional Storm Drain System (2 of 2)



Source: Metro 2021d

4.11.2.2 Water Quality

The LARWQCB Basin Plan designates beneficial uses for surface and groundwater in the Los Angeles Basin area for both the Los Angeles and San Gabriel River Watersheds. Table 4.11.1 lists the beneficial uses identified for the surface waters within the Affected Area for water resources.

Table 4.11.1. Beneficial Uses of Surface Water in the Affected Area

Surface Water Body	Beneficial Uses[1]
Los Angeles River Reach 2 (Carson St to Rio Hondo Confluence)	Municipal and Domestic Supply (potential), Industrial Service Supply (potential), Groundwater Recharge, Warm Freshwater Habitat, and Wildlife Habitat (potential)
Ballona Creek Reach 1 (above National Blvd)	Municipal and Domestic Supply (potential), Warm Freshwater Habitat (potential), Wildlife Habitat
Compton Creek	Municipal and Domestic Supply (potential), Groundwater Recharge, Warm Freshwater Habitat, Wildlife Habitat, Wetland Habitat
Rio Hondo Reach 1 (Los Angeles River confluence to Santa Ana Freeway)	Municipal and Domestic Supply (potential), Groundwater Recharge (intermittent), Warm Freshwater Habitat (potential) and Wildlife Habitat (intermittent)
Los Cerritos Channel	Municipal and Domestic Supply (potential), Warm Freshwater Habitat (intermittent), Wildlife Habitat
San Gabriel River Reach 1 (San Gabriel River Estuary to Firestone Blvd)	Municipal and Domestic Supply (potential), Warm Freshwater Habitat and Wildlife Habitat (potential)
Coyote Creek	Municipal and Domestic Supply (potential), Industrial Service Supply (potential), Industrial Process Supply (potential), Warm Freshwater Habitat, Wildlife Habitat (potential), and Rare, Threatened or Endangered Species
Inland Surface Waters	Beneficial uses of inland surface waters generally include Water Contact Recreation and Warm Freshwater Habitat, Cold Freshwater Habitat, Inland Saline Water Habitat, or Commercial and Sport Fishing. In addition, inland waters are usually designated as Industrial Service Supply, Industrial Process Supply, Non-contact Water Recreation, and Wildlife Habitat, and are sometimes designated as Preservation of Biological Habitats and Rare, Threatened, or Endangered Species

Source: LARWQCB 2011
Note: [1] Beneficial uses are existing unless noted as "potential."

Water bodies not meeting the beneficial uses of state water quality standards are placed on the Section 303(d) List of Water Quality Limited Segments, and states are required to develop TMDLs for the pollutants causing the impairment. Table 4.11.2 lists the pollutants causing impairments in the surface water bodies within the Affected Area for water resources. The Build Alternatives are a redevelopment within these watersheds and are therefore subject to the TMDL standards.

Table 4.11.2. Section 303(d) List of Impaired Waters in the Affected Area

Water Body	Impairment	Source of Impairment	TMDL Completion Date
Los Angeles River Reach 2 (Carson St to Rio Hondo confluence)	Ammonia	Point and Nonpoint Sources	2004
	Indicator bacteria	Source Unknown	2012
	Copper	Source Unknown	2005
	Lead	Point and Nonpoint Sources	2005
	Nutrients (algae)	Point and Nonpoint Sources	2004
	Oil	Natural Sources	2019
	Trash	Nonpoint Source, Surface Runoff, Urban Runoff/Storm Sewers	2008
Ballona Creek	Copper	Source Unknown	2005
	Cyanide	Source Unknown	2019
	Indicator bacteria	Point and Nonpoint Sources	2007
	Lead	Source Unknown	2005
	Toxicity	Source Unknown	2005
	Trash	Source Unknown	2001
	Viruses (enteric)	Point and Nonpoint Sources	2007
	Zinc	Source Unknown	2005
Compton Creek	Benthic community effects	Source Unknown	2021
	Copper	Source Unknown	2008
	Indicator bacteria	Source Unknown	2009
	Lead	Source Unknown	2005
	Trash	Nonpoint Source	2008
	Zinc	Source Unknown	2008
	pH	Point and Nonpoint Sources	2004
Rio Hondo Reach 1 (Los Angeles River confluence to Santa Ana Freeway)	Indicator bacteria	Source Unknown	2012
	Copper	Source Unknown	2005
	Lead	Point and Nonpoint Source	2005
	Toxicity	Source Unknown	2021
	Zinc	Point and Nonpoint Source	2005
	pH	Point and Nonpoint Source	2004
	Trash	Nonpoint Source, Surface Runoff, Urban Runoff/Storm Sewers	2008

Water Body	Impairment	Source of Impairment	TMDL Completion Date
Los Cerritos Channel	Ammonia	Source Unknown	2015
	Bis (2-ethylhexyl) phthalate	Source Unknown	2019
	Copper	Source Unknown	2019
	Indicator bacteria	Source Unknown	2019
	Lead	Source Unknown	2019
	Trash	Source Unknown	2019
	Zinc	Source Unknown	2019
	pH	Source Unknown	2021
San Gabriel River Reach 1 (San Gabriel River Estuary to Firestone Boulevard)	Temperature, water	Source Unknown	2027
	pH	Source Unknown	2009
Coyote Creek	Indicator Bacteria	Source Unknown	2016
	Iron	Source Unknown	2027
	Malathion	Source Unknown	2027
	Toxicity	Source Unknown	2008
	pH	Source Unknown	2019

Source: SWRCB 2016
Note: TMDL = total maximum daily load

4.11.2.3 Floodplains

LA County is subject to a wide range of flood hazards, including floods caused by intense storms, earthquakes, and failure of man-made structures. Los Angeles and nearby cities are located in a relatively flat alluvial plain, about 30 miles wide, lying on uplift terraces surrounded by mountain ranges. FEMA Flood Insurance Rate Maps identify areas in LA County and surrounding cities that would be subject to flooding during 100-year and 500-year storm events.

Figure 4.11-4 presents the FEMA-established 100-year flood zones for the Los Angeles River, the Rio Hondo Channel, the San Gabriel River, and Coyote Creek, which are each contained within their engineered banks. Although the Affected Area for water resources is tributary to Ballona Creek, the creek and associated flood zones are not within the Affected Area. Approximately half of the Affected Area for water resources is located within larger flood zones designated by FEMA Flood Insurance Rate Maps as "Zone X," which are characterized as "areas of 0.2 percent annual chance of flood; areas of 1 percent annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1 percent annual chance of flood." Dams, debris basins, and spreading grounds are considered integral flood-control infrastructure. Debris basins are used to capture the sediment, gravel, boulders, and vegetative debris that are washed out of the canyons during storms. Spreading grounds are areas located adjacent to river channels or within soft-bottom channels to permit water to percolate into groundwater basins for later pumping. There are no dams, debris basins, or spreading grounds within the Affected Area for water resources.

Figure 4.11-4. FEMA Flood Zones in Affected Area and Major Flood-Control Facilities

Source: Metro 2021d

4.11.2.4 Groundwater

This section presents the evaluation of groundwater as a water resource (groundwater supply and quality). The evaluation of groundwater contamination is presented in the *West Santa Ana Branch Transit Corridor Project Final Hazardous Materials Impact Analysis Report* (Metro 2021p), included as Appendix S to this Draft EIS/EIR, and Section 4.10, Hazards and Hazardous Materials, of this Draft EIS/EIR.

The Central Basin is a groundwater reservoir that underlies the Affected Area for water resources, as shown in Figure 4.11-5. The Central Basin is a subbasin of the Los Angeles Coastal Plain Groundwater Basins, which are incorporated into the Coastal Plain Hydrographic Subunit. The Central Basin, one of the most important basins in the hydrographic subunit, directly underlies the Affected Area for water resources. The basin is an unconfined aquifer with soils that allow water to percolate through the basin (LACDPW 2006).

Historical over-pumping of the Central Basin caused overdraft, seawater intrusion, and other groundwater management problems related to supply and quality. Adjudication of the basins in the early 1960s set a limit on allowable groundwater extractions in order to control the over-pumping (WRD 2019). Under SGMA, adjudicated portions of basins are exempt from developing a Groundwater Sustainability Plan and forming a GSA. However, WRD is required to submit annual reports to confirm proper resource management. LACDPW, the WRD, and the U.S. Geological Survey conduct regional groundwater quality monitoring in the Central Basin. Groundwater is recharged within the Central Basin at the Rio Hondo Coastal Basin Spreading Grounds, the San Gabriel Coastal Spreading Grounds, and the Dominguez Gap Spreading Grounds. Groundwater quality information for the Central Basin is included in Section 4.4 of the Water Resources Impact Analysis Report (Appendix T).

4.11.3 Environmental Consequences/Environmental Impacts

4.11.3.1 Project Design Features

Within existing rivers, the Build Alternatives would require construction activities (e.g., demolition and removal of built features, excavation, water flow diversions) and introduction of new or modified features (bridge abutments and columns) that could have direct and indirect water quality impacts. As a result, the Build Alternatives would be required to obtain various mandatory permits prior to construction, as described in Section 4.9.1.1 in the Geotechnical, Subsurface, and Seismic Section and Section 2.5.7 in the Alternatives Considered/Project Description Chapter. Therefore, the design features summarized below are considered to be part of the Build Alternatives, and Metro will confirm that these design features are implemented to avoid and minimize impacts to water quality and water resources.

Figure 4.11-5. Groundwater Basins and Facilities

Source: Metro 2021d

The *West Santa Ana Branch Transit Corridor Project Environmental Study, Sustainability Stormwater Study – Revision 1* (Metro 2020a) was developed to evaluate the feasibility of capturing and managing stormwater and associated pollutants, prioritize projects for future implementation, and identify stormwater-related sustainability features and strategies along the project alignment to support Metro sustainability goals and to comply with stormwater quality regulations. The study provides recommendations for site design and low impact development (LID) stormwater BMP implementation locations along the project alignment. These BMPs would maintain pre-development flow volumes, peak flow rates, and times of concentration, and would avoid and minimize adverse effects to water quality and water resources. These recommendations will be included in the final construction contract as applicable to the Build Alternatives:

- **Stations:** General recommendations for LID BMPs at underground station entrances, at-grade, and aerial stations include bioretention/biofiltration planters for canopy, roof, platform runoff; impervious area disconnection (direction impervious sheet flow to landscape areas); and permeable pavement.
- **Station Parking:** LID BMP implementation recommendations at station parking facilities include the following: grade parking facilities to perimeter landscaping areas, design and construct zero-height curb or curb cuts to direct parking area sheet flow runoff into landscaping and biofiltration areas, bioretention/biofiltration within the perimeter (or interior) landscape areas, and other LID features, such as tree wells and permeable pavement.
- **MSF:** Recommended LID BMPs for the MSF site options include biofiltration and capture and reuse. Roof rainfall runoff could be collected from the buildings, treated, and stored for use for the wash facilities; however, the feasibility of this is based on anticipated water demand/usage.
- **Aerial Crossings:** LID BMP implementation recommendations for aerial crossings consist of lined bioretention/biofiltration with underdrain between columns beneath viaducts and lined bioretention/biofiltration with underdrain adjacent to crossing/bridge abutments.
- **At-grade Track:** Stormwater sustainability including water quality treatment options along the at-grade tracks is typically limited because of the undesirability of infiltration and vegetation limitations in these areas. However, ballasted track can be considered self-treating areas based upon research conducted by the Colorado Department of Transportation (2012).

During final design, the LID BMP recommendations would be validated. Where infiltration BMPs are proposed, site-specific geotechnical investigations would be conducted to verify feasibility of installing the BMPs.

In addition to the LID BMPs recommended by the Sustainability Stormwater Study (Metro 2020a), the following design features would be applicable to the Build Alternatives:

- To comply with the LA County MS4 NPDES permit and LA County Standard Urban Stormwater Management Plan (LACDPW 2000b), the Build Alternatives would develop a site-specific LID plan that would implement LID design standards such as incorporating structural and nonstructural treatment controls and hydromodification controls. Other LID design standards would include the following:

  - Not exceed the estimated pre-development rate for developments where the increased peak stormwater discharge rate would result in increased potential for downstream erosion
  - Conserve natural areas and minimize the extent of disturbed areas
  - Minimize stormwater pollutants of concern
  - Protect slopes and channels
  - Provide storm drain system stenciling and signage
  - Properly design outdoor material storage areas
  - Properly design trash storage areas
  - Provide proof of ongoing BMP maintenance
  - Design standards for structural or treatment control BMPs
  - Implement pollutant source reduction measures
  - Design and construct appropriate onsite stormwater management facilities to control peak flow rates and volumes and to capture and treat runoff prior to discharge, especially for pollutant-generating surfaces such as station parking areas, access roads, new local street improvements, reconstructed interchanges, and new or relocated roads and highways
  - Use LID techniques to retain runoff onsite and to reduce offsite runoff, to the extent practical; consider the use of constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips
  - Locate all constructed stormwater BMPs outside of natural water bodies and streams
  - Use portions of the maintenance site for onsite infiltration of runoff, if feasible, or for stormwater detention, if not feasible

- Construct the tunnel and underground stations to preclude groundwater intrusion into the tunnel using a technique similar to that used for the Metro L (Gold) Line tunnels in Boyle Heights. This technique consists of installing a precast concrete lining with rubber gaskets between the tunnel segments to prevent water and gas leakage into the tunnel and stations.
- Use tunnel drainage systems to intercept groundwater, stormwater, and tunnel wash water. Treat water to meet municipal standards before it is pumped and discharged to the local storm drain system.
- Comply with the IGP. The IGP requires preparation and implementation of an industrial SWPPP, which would identify BMPs to reduce or prevent industrial pollutants in stormwater and authorized nonstormwater discharges. The industrial SWPPP also requires implementation of a monitoring implementation plan and annual comprehensive facility compliance evaluation to assess BMP performance. The industrial SWPPP would include site-specific measures such as:

  - Implement nonstructural source-control BMPs, including good housekeeping, preventative maintenance, spill prevention and response, material handling and storage, waste handling and recycling, employee training, inspections, record keeping and internal reporting, and quality assurance
  - Construct berms, ditches, or simple curbing to prevent run-on and divert runoff water from around the industrial activity area

  - Provide cover over materials, chemicals, and pollutant sources to prevent contact with stormwater and unauthorized nonstormwater discharges; where possible, move outdoor operations indoors
  - Provide secondary containment around storage tanks and other areas to collect any leaks or spills
  - Develop a Spill Prevention, Control and Countermeasures Plan
  - Designate equipment wash areas
  - Comply with hazardous materials laws and regulations, including hazardous materials inventory and emergency response planning, risk planning and accident prevention, employee hazard communication, public notification of potential exposure to specific chemicals, and proper storage of hazardous materials

- Establish track elevation to prevent saturation and infiltration of stormwater into the subballast. During the design storm, maintain 2 feet of freeboard between the subballast and the water surface elevation.
- Minimize impacts to existing flood-control channels. Design and orient bridge piers to be parallel to the water flow direction.
- Maintain bridge deck low chord elevations to be higher than the existing Union Pacific Railroad rail crossings over the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River.
- Conduct engineering analysis of channel hydraulics during detailed final design to evaluate impacts to channel water surface elevation and available freeboard.

4.11.3.2 No Build Alternative

Under the No Build Alternative, the Build Alternative would not be developed. However, several infrastructure and transportation-related projects would be implemented and built in the vicinity of the project alignment. These projects could have impacts to hydrology and surface water bodies, water quality, floodplains, and groundwater. Planned projects would be subject to separate environmental analyses to evaluate potential impacts. Implementation of these projects, including operations and maintenance, would be subject to the regulatory standards, conditions, and permitting requirements discussed in Section 4.9.1.1 in the Geotechnical, Subsurface, and Seismic Section, as applicable to the Build Alternatives. Compliance with these standards would minimize impacts, and residual impacts are expected to be minor. Therefore, no adverse effects to hydrology and surface water bodies, water quality, floodplains, or groundwater are anticipated from the No Build Alternative.

4.11.3.3 Alternative 1: Los Angeles Union Station to Pioneer Station

Hydrology and Surface Water Bodies

Alternative 1 would convert existing pervious areas to impervious area within the Affected Area for water resources. Specifically, increases in impervious surfaces would result from the alignment guideway, stations, parking facilities, local street improvements, MSF, TPSS facilities. Conversion of pervious to impervious area decreases infiltration, which increases runoff volumes and peak flow rates, and changes the timing of the peak flows. Development within the already urbanized corridor would also affect existing drainage systems, including local storm drains and regional flood-control facilities. The project features and BMPs referenced in Section 4.11.3.1 include site design and LID stormwater BMPs that would maintain pre-development flow volumes, peak flow rates, and times of concentration. These BMPs would avoid and minimze adverse effects to the project area. Therefore, Alternative 1 would not result in adverse effects to hydrology and water bodies.

As shown in Table 4.11.3, Alternative 1 would result in conversion of 14.7 acres from pervious area to impervious area, with a total disturbance area of 202.3 acres. Pervious areas that would be converted include unpaved areas within the railroad rights-of-way and presently unpaved parcels that would be developed for other supporting rail facilities. In some areas, existing impervious surface would be removed and replaced by pervious surface such as landscaping or ballast track. For example, within Huntington Park the existing freight track would be relocated west by up to 30 feet to accommodate new LRT tracks. This shift to the west would require replacement of existing paved parking with ballast track. By comparison, 32 percent of the Los Angeles River Watershed (169,800 acres), 40 percent of the Ballona Creek Watershed (33,300 acres), and 29 percent of the San Gabriel River Watershed (118,800 acres) are estimated to be impervious based on assumptions of land use type (LARWQCB 2017a; LACDPW 2017a; Weston Solutions, Inc. 2005).

Table 4.11.3. Change in Impervious Area—Build Alternatives

Alternative	Component	Watershed	Total Disturbed Area[1] (acres)	Existing Impervious Area[2] (acres)	Proposed Impervious Area[3] (acres)	New Impervious Area[4] (acres)
1	Rail/Stations	Los Angeles River, Ballona Creek, San Gabriel River	199.7	34.6	48.2	13.6
	TPSS Facilities	Los Angeles River, San Gabriel River	2.6	1.5	2.6	1.1
	Total	Los Angeles River, Ballona Creek, San Gabriel River	202.3	36.1	50.8	14.7
2	Rail/Stations	Los Angeles River, Ballona Creek, San Gabriel River	199.6	35.0	48.5	13.5
	TPSS Facilities	Los Angeles River, San Gabriel River	3.6	2.2	3.6	1.4
	Total	Los Angeles River, Ballona Creek, San Gabriel River	203.2	37.2	52.1	14.9
3	Rail/Stations	Los Angeles River, San Gabriel River	180.7	25.6	33.0	7.4
	TPSS Facilities	Los Angeles River, San Gabriel River	2.3	1.4	2.3	0.9
	Total	Los Angeles River, San Gabriel River	183.0	27.0	35.3	8.3

Alternative	Component	Watershed	Total Disturbed Area[1] (acres)	Existing Impervious Area[2] (acres)	Proposed Impervious Area[3] (acres)	New Impervious Area[4] (acres)
4	Rail/Stations	Los Angeles River, San Gabriel River	83.0	9.4	12.3	2.9
	TPSS Facilities	Los Angeles River, San Gabriel River	0.8	0.3	0.8	0.5
	Total	Los Angeles River, San Gabriel River	83.8	9.7	13.1	3.4

Source: Metro 2021d
Notes: [1] Total Disturbed Area is the area of disturbed soil generated by the Build Alternatives.
[2] Existing Impervious Area is the pre-construction impervious surfaces that exist within the project right of way.
[3] Proposed Impervious Area is the area consisting of replaced impervious surfaces and new impervious surfaces within the project right of way.
[4] New Impervious Area is the conversion of existing pervious (unpaved) areas to impervious area (e.g., the difference between Existing Impervious Area and Proposed Impervious Area = New Impervious Area).
TPSS = traction power substation

As stated previously, Alternative 1 would be located in a highly urbanized area and along major roadways and rail corridors, which are predominantly paved surfaces or highly compacted unpaved areas with reduced infiltrative capacity. The increase in impervious area resulting from Alternative 1 (14.7 acres) would affect approximately 0.005 percent of the overall watershed area (320,800 acres total) and, therefore, would cause a negligible overall decrease in infiltrative capacity in these watersheds. As such, Alternative 1 would not result in adverse effects to hydrology.

Alternative 1 would cross several LA County, local, and regional storm drainage facilities, which are shown on Figure 4.11-2 and Figure 4.11-3. A list of affected LACFCD regional storm drainage systems for each of the Build Alternatives is provided in Section 5 of the Water Resources Impact Analysis Report (Appendix T).

Modifications to local storm drain systems would be required to discharge runoff from the alignment. New drainage pipes under at-grade track would collect stormwater to earthen or concrete drainage swales running parallel to the track. Drainage systems within the portions of aerial track and near tunnel portals would collect and discharge stormwater to the existing local stormwater infrastructure. These modifications are required and are not expected to adversely affect existing storm drains because the Build Alternatives would not substantially alter the existing drainage patterns.

To minimize impacts to hydrology and water bodies, Alternative 1 would include implementing the applicable design features discussed in Section 4.11.3.1 and would maintain pre-development hydrology characteristics. Alternative 1 would comply with the post-construction and hydromodification requirements of the LA County MS4 NPDES permit, as discussed in Section 3 of the Water Resources Impact Analysis Report (Appendix T). New or modified storm drainage systems would be designed to meet local and regional standards. Under NEPA, Alternative 1 would not result in adverse effects to hydrology and surface water bodies and mitigation would not be required.

Water Quality

Alternative 1 would result in new impervious areas that could increase the concentration and total load of pollutants in stormwater runoff. As indicated in Table 4.11.3, Alternative 1 would result in conversion of 14.7 acres from pervious area to impervious area. Conversion of pervious to impervious area decreases infiltration, which increases the concentration and total pollutant load in stormwater runoff. Because Alternative 1 would be located in a highly urbanized area and along major roadways and rail corridors, and the new impervious surfaces would be distributed across the corridor, the new impervious area would represent a negligible overall increase in total impervious area with respect to the watersheds and the corresponding potential for increases in pollutant loads in stormwater runoff. Implementation of Alternative 1 would be subject to the regulatory standards, conditions, and permitting requirements described in Section 4.9.1.1 in the Geotechnical, Subsurface, and Seismic Section (e.g., CWA and NPDES permit requirements). Project design features described in Section 4.11.3.1 would be implemented to address potential effects and minimize direct impacts to water quality. Under NEPA, Alternative 1 would not result in adverse effects to water quality in the Affected Area for water resources and mitigation would not be required.

Rail Operations: Rail operations would contribute pollutants in concentrations and amounts that are typical for transportation facilities, including total suspended solids, metals, oil and grease, and debris. As discussed in Section 4.11.1.2, impacts to water quality from rail operations can be generally quantified by length of track. Table 4.11.4 summarizes the length of each type of rail alignment (aerial, at-grade, and below-grade). Because Alternative 1 would be located in a highly urbanized area and along existing major roadways and rail corridors, the character and concentration of pollutants in runoff would be similar to existing conditions. Impacts to groundwater from below-grade track are described under the heading "Groundwater." The design features described in Section 4.11.3.1 would be implemented to minimize direct water quality impacts from rail operations. Under NEPA, Alternative 1 would not result in adverse effects to water quality from rail operations.

Table 4.11.4. Aerial, At-Grade, and Underground Track Lengths—Build Alternatives

Alternative	Length of Aerial Track (miles)	Length of At-Grade Track (miles)	Length of Tunnel (miles)
Alternative 1	4.7	12.3	2.3
Alternative 2	4.7	12.3	2.3
Alternative 3	2.6	12.2	N/A
Alternative 4	1.0	5.6	N/A

Source: Metro 2021d
Note: N/A = not applicable

Stations, Parking Facilities, and Local Street Improvements: Development of stations, parking facilities, and local street improvements could result in water quality impacts due to the new impervious surfaces that would be developed. Conversion of pervious to impervious area decreases infiltration, which increases the concentration and total pollutant load in stormwater runoff. In addition to new impervious surfaces, stations, street improvements, and parking facilities would increase vehicle and pedestrian traffic, which is expected to increase loads for pollutants associated with transportation facilities, such as heavy metals,

nutrients, pesticides, sediments, trash and debris, oxygen-demanding substances, and oil and grease (California Stormwater Quality Association [CASQA] 2003). However, the design features described in Section 4.11.3.1 would be implemented to minimize direct water quality impacts resulting from stations, parking facilities, and local street improvements. Under NEPA, Alternative 1 would not result in adverse effects to water quality from stations, parking facilities, and local street improvements.

Traction Power Substations: TPSS sites would result in water quality impacts due to associated new impervious surfaces. Conversion of pervious to impervious area decreases infiltration, which increases the concentration and total pollutant load in stormwater runoff. In addition to new impervious surfaces, TPSS operations and maintenance are expected to increase loads for pollutants associated with industrial activities, such as sediment, nutrients, trash, metals, oil and grease, and organics (CASQA 2003). However, the design features described in Section 4.11.3.1 would be implemented to address and minimize direct impacts to water quality associated with TPSS facilities. Under NEPA, Alternative 1 would not result in adverse effects to water quality from TPSSs.

Floodplains

Alternative 1 would cross three major flood-control channels, each with FEMA-established floodplains: the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River. Historic floodplains are protected from these rivers by levees and engineered channels constructed by the USACE. The FEMA-delineated 100-year floodplains are contained within the banks of the flood-control channels for all three water bodies. Alternative 1 would be designed in compliance with Executive Orders 11988 and 13690. Tracks and structures associated with Alternative 1 would be built above the existing river channel walls or levees. Alternative 1 would not encroach along the length of the river or result in incompatible development within the floodplain. Therefore, impacts would be minimized, and Alternative 1 would not result in adverse effects to floodplains.

The Alternative 1 alignment would cross the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River, and a majority of the southern part of the alignment is located within Flood Zone X. Operation of Alternative 1 would generally be outside the flood-control channels and, therefore, protected from flooding except during extreme events.

For each river crossing, a location hydraulic study was prepared to evaluate the bridge structure's effects on the hydraulic conditions within the river channel and to estimate the change in water surface elevations within the channel. The location hydraulic studies are included as appendices to the Water Resources Impact Analysis Report (Appendix T). The new bridge structures in the Los Angeles River and the Rio Hondo Channel would be constructed in the floodplain north of the existing bridges. To limit impacts to floodwaters and the existing flood-control channels, aerial LRT structures would be elevated above existing levees. Because the bridge piers would be built in the channel, they would be subject to flooding. The impact to water surface elevation in each river channel would be less than 1 foot, and flood flows would continue to be fully contained within the channel (Metro 2017a; 2017b).

The new bridge structure in the San Gabriel River would be constructed in the floodplain to replace the existing bridge. To limit impacts to floodwaters and the existing flood-control channel, aerial LRT structures would be elevated above the existing channel walls. Because the bridge piers would be built in the channel, they would be subject to flooding. Due to the hydraulic conditions in the channel, the impact to water surface elevation would reduce the

water surface in the channel near the project site, and flood flows would continue to be fully contained within the channel (Metro 2017e).

Alternative 1 would not have a longitudinal encroachment into the floodplain or impact beneficial floodplain values. Alternative 1 would not increase flooding risk by supporting incompatible development within the floodplain. Furthermore, compliance with local and federal floodplain regulations would avoid and minimize impacts to the flood-control facilities. Under NEPA, Alternative 1 would not result in adverse effects to floodplains and mitigation would not be required.

Groundwater

This section presents the evaluation of groundwater as a water resource (groundwater supply and quality). Evaluation of groundwater contamination is presented in the Hazardous Materials Impact Analysis Report (Appendix S).

Alternative 1 would increase the impervious area, thereby decreasing groundwater recharge. As Table 4.11.3 shows, Alternative 1 would convert 14.7 acres from pervious area to new impervious area. This represents a 0.008 percent increase in the impervious area in the watershed, which would cause a negligible impact to groundwater recharge. In comparison, 32 percent of the Los Angeles River Watershed (168,800 acres) and 29 percent of the San Gabriel River Watershed (118,800 acres) are estimated to be impervious based on assumptions of land use type (LARWQCB 2017b; LACDPW 2017b; Weston Solutions, Inc. 2005). Groundwater recharge within the Central Basin is primarily from spreading grounds and over land surfaces. By comparison, the entire basin is 177,000 acres (DWR 2004). Because Alternative 1 is in a highly urbanized area and along existing major roadways and rail corridors, the new impervious area would represent a negligible overall increase in total impervious area with respect to the watersheds and the corresponding groundwater recharge areas. To minimize the impacts of new impervious area, Alternative 1 would comply with the post-construction and hydromodification requirements of the LA County MS4 NPDES permit, as discussed in Section 3.3 of the Water Resources Impact Analysis Report (Appendix T) and would implement the design features discussed in Section 4.11.3.1. These design features include LID treatment controls, such as landscaping, to help offset the loss of permeable surfaces. Furthermore, most recharge to the groundwater supply in LA County comes from large, natural stream systems or constructed groundwater recharge basins, which would be minimally affected by the Project. Therefore, Alternative 1 impacts to groundwater resources would be minimized and would not result in adverse effects to groundwater.

A total of 2.3 miles of tunnel would be built under Alternative 1. These tunnels are expected to be built below the groundwater table and could provide a direct path for groundwater exfiltration. Construction and operation of the tunnels could also provide a path for contaminants to enter groundwater, for example by exposing soil and groundwater to construction-related contaminants. These impacts are discussed in detail in Section 4.19.3.11 (construction-related water resources section). To avoid and minimize direct and indirect impacts to groundwater, the tunnel and underground stations would be constructed to preclude groundwater intrusion into the tunnel using a technique similar to that used for the Metro L (Gold) Line tunnels in Boyle Heights. This technique consists of installing a precast concrete lining with rubber gaskets between the tunnel segments to prevent water and gas leakage into the tunnel and stations. In the unlikely event that groundwater accumulates in tunnels during operation, the water would be pumped out and treated to meet municipal

standards before being discharged to the local sewer system. Under NEPA, Alternative 1 would not result in adverse effects to groundwater and mitigation would not be required. An evaluation of groundwater with respect to geotechnical impacts is presented in the *West Santa Ana Branch Transit Corridor Project Final Geotechnical, Subsurface, and Seismic Impact Analysis Report* (Metro 2021e), included as Appendix O to this Draft EIS/EIR, and Section 4.9, Geotechnical, Subsurface, and Seismic, of this Draft EIS/EIR.

4.11.3.4 Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternative 2 would have impacts similar to the impacts identified for Alternative 1 in regard to water quality, floodplains, and groundwater, as described in Section 4.11.3.3. The following section describes Alternative 2 impacts relative to Alternative 1.

Hydrology and Surface Water Bodies

The overall hydrology and surface water body impacts from Alternative 2 would be similar to Alternative 1 because the project footprint and total disturbed areas are similar. As summarized in Table 4.11.3, the Alternative 2 total disturbed area is 203.2 acres, with a total of 14.9 acres that would be converted from pervious area to impervious area due to construction of pavement, rooftops, and other hard surfaces. The increase in impervious area resulting from Alternative 2 would affect approximately 0.005 percent of the overall watershed area (320,800 acres total) and, therefore, would cause a negligible overall decrease in infiltrative capacity in these watersheds.

Alternative 2 would cross several LA County, local, and regional storm drainage facilities (Figure 4.11-2 and Figure 4.11-3). A list of affected LACFCD regional storm drainage systems for each of the Build Alternatives is provided in Section 5 of the Water Resources Impact Analysis Report (Appendix T).

As described in Section 4.11.3.3, project impacts to hydrology and surface water bodies would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 2. Under NEPA, Alternative 2 would not result in adverse effects to hydrology and surface water bodies, and mitigation would not be required.

Water Quality

The overall water quality impacts from Alternative 2 would be similar to Alternative 1 because the project footprint and total disturbed areas are similar. As summarized in Table 4.11.3, the total disturbed area for Alternative 2 is 203.2 acres. A total of 14.9 acres would be converted from pervious area to impervious area due to construction of pavement, rooftops, and other hard surfaces. As discussed in Section 4.11.1.2, impacts to water quality from rail operations can be generally quantified by length of track because the track operations areas collect pollutants and could discharge them in stormwater as nonpoint source pollution. As discussed in Section 4.11.3.3, the length of track is a useful way to compare Build Alternatives for their magnitude, quality, and location of potential water quality impacts. Table 4.11.4 summarizes the length of each type of rail alignment (aerial, at-grade, and below-grade). As described in Section 4.11.3.3, project impacts to water quality would be avoided or minimized because Alternative 2 would implement the same design features described in Section 4.11.3.1. Under NEPA, Alternative 2 would not result in adverse effects to water quality and mitigation would not be required.

Floodplains

The potential for floodplain impacts from the Alternative 2 facilities is similar to Alternative 1, as described in Section 4.11.3.3, because Alternative 2 would require the same crossings at the Los Angeles River, Rio Hondo, and San Gabriel River. As described in Section 4.11.3.3, project impacts would be avoided or minimized with implementation of the design features described in Section 4.11.3.1; these same features would be implemented with Alternative 2. Under NEPA, Alternative 2 would not result in adverse effects to floodplains and mitigation would not be required.

Groundwater

The potential for groundwater impacts from the Alternative 2 facilities is similar to Alternative 1, as described in Section 4.11.3.3, because the project footprint and total disturbed areas are similar. As summarized in Table 4.11.3, the total disturbed area of Alternative 2 is 203.2 acres. A total of 14.9 acres would be converted from pervious area to impervious area due to construction of pavement, rooftops, and other hard surfaces.

In the Central Basin, the Alternative 2 facilities are the same as Alternative 1 (see Section 4.11.3.3 and Figure 4.11-1). Therefore, impacts to groundwater would be similar to those at the same facilities for Alternative 1. As described in Section 4.11.3.3, groundwater impacts would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 2. Under NEPA, Alternative 2 would not result in adverse effects to groundwater and mitigation would not be required.

4.11.3.5 Alternative 3: Slauson/A (Blue) Line to Pioneer Station

While Alternative 3 would have a shorter alignment and fewer stations than Alternative 1, Alternative 3 would be substantially similar to the impacts identified for Alternative 1 in regard to water quality, floodplains, and groundwater, as described in Section 4.11.3.3. The following sections describe Alternative 3 impacts relative to Alternative 1.

Hydrology and Surface Water Bodies

The overall hydrology and surface water body impacts from Alternative 3 would be reduced compared to Alternative 1 because the project footprint and total disturbed areas are smaller. As summarized in Table 4.11.3, the Alternative 3 total disturbed area is 183 acres, with a total of 8.3 acres that would be converted from pervious area to impervious area due to construction of pavement, rooftops, and other hard surfaces. The increase in impervious area resulting from Alternative 3 would affect approximately 0.003 percent of the overall watershed area (320,800 acres total) and, therefore, would cause a negligible overall decrease in infiltrative capacity in these watersheds.

Alternative 3 would cross several LA County, local, and regional storm drainage facilities, which are shown on Figure 4.11-2 and Figure 4.11-3. A list of affected LACFCD regional storm drainage systems for each of the Build Alternatives is provided in Section 5 of the Water Resources Impact Analysis Report (Appendix T).

In the Los Angeles River and San Gabriel River Watersheds, Alternative 3 facilities would be the same as Alternative 1. Therefore, impacts in this watershed would be similar to those at the same facilities for Alternative 1 (see Section 4.11.3.3). In the Los Angeles River Watershed, the Alternative 3 footprint is smaller; therefore, impacts would be reduced

(Figure 4.11-1). As described in Section 4.11.3.3, project impacts to hydrology and surface water bodies would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 3. Under NEPA, Alternative 3 would not result in adverse effects to hydrology and surface water bodies and mitigation would not be required.

Water Quality

The overall water quality impacts from Alternative 3 would be reduced compared to Alternative 1 because the project footprint and total disturbed areas are smaller, and the alignment is shorter. As summarized in Table 4.11.3, the total disturbed area for Alternative 3 is 183 acres. A total of 8.3 acres would be converted from pervious area to impervious area due to construction of pavement, rooftops, and other hard surfaces. As discussed in Section 4.11.1.2, impacts to water quality from rail operations can be generally quantified by length of track. Table 4.11.4 summarizes the length of each type of rail alignment (aerial, at-grade, and below-grade).

In the Los Angeles and San Gabriel River Watersheds, the Alternative 3 facilities would be the same as Alternative 1. Therefore, impacts to water quality in this watershed would be similar to those at the same facilities for Alternative 1 (see Section 4.11.3.3). In the Los Angeles River Watershed, the Alternative 3 footprint is smaller; therefore, water quality impacts would be reduced (Figure 4.11-1). As described in Section 4.11.3.3, project impacts to water quality would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 3. Under NEPA, Alternative 3 would not result in adverse effects to water quality and mitigation would not be required.

Floodplains

The potential for floodplain impacts from the Alternative 3 facilities is similar to Alternative 1, as described in Section 4.11.3.3, because Alternative 3 would require the same crossings at the Los Angeles River, Rio Hondo, and San Gabriel River. As described in Section 4.11.3.3, project impacts would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 3. Under NEPA, Alternative 3 would not result in adverse effects to floodplains and mitigation would not be required.

Groundwater

The potential for groundwater impacts from the Alternative 3 facilities is similar to Alternative 1, as described in Section 4.11.3.3. The level of groundwater impacts would be less than Alternative 1 because the project footprint and total disturbed areas are smaller and there are no tunnel sections. As summarized in Table 4.11.3, the Alternative 3 total disturbed area is 183 acres. A total of 8.3 acres would be converted from pervious area to impervious area due to construction of pavement, rooftops, and other hard surfaces.

In the Central Basin, the Alternative 3 facilities are the same as Alternative 1 (see Section 4.11.3.3 and Figure 4.11-1). Therefore, impacts to groundwater would be similar to those at the same facilities for Alternative 1. As described in Section 4.11.3.3, all groundwater impacts from Alternative 3 would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for

Alternative 3. Under NEPA, Alternative 3 would not result in adverse effects to groundwater and mitigation would not be required.

4.11.3.6 Alternative 4: I-105/C (Green) Line to Pioneer Station

While Alternative 4 would result in a shorter alignment and fewer stations than Alternative 1, Alternative 4 would be similar to Alternative 1 in regard to water quality, floodplains, and groundwater, as described in Section 4.11.3.3. The following section describes Alternative 4 impacts as related to Alternative 1.

Hydrology and Surface Water Bodies

The potential for hydrology and surface water body impacts from the Alternative 4 facilities is similar to Alternative 1, as described in Section 4.11.3.3. The level of impacts would be less than Alternative 1 because the project footprint and total disturbed areas are smaller. As summarized in Table 4.11.3, the Alternative 4 total disturbed area is 83.8 acres with a total of 3.4 acres that would be converted from impervious area to pervious area based on the construction of pavement, rooftops, and other hard surfaces. The increase in impervious area resulting from Alternative 4 (3.4 acres) would affect approximately 0.001 percent of the overall watershed area (320,800 acres total) and, therefore, would cause a negligible overall decrease in infiltrative capacity in these watersheds.

Alternative 4 would cross several LA County, local, and regional storm drainage facilities, which are shown on Figure 4.11-2 and Figure 4.11-3. A list of affected LACFCD regional storm drainage systems for each of the Build Alternatives is provided in Section 5 of the Water Resources Impact Analysis Report (Appendix T).

In the Los Angeles River and San Gabriel River Watersheds, the Alternative 4 facilities are the same as Alternative 1 (see Section 4.11.3.3 and Figure 4.11-1). Therefore, impacts to hydrology and surface water bodies in this watershed would be similar to those at the same facilities for Alternative 1. Within the Los Angeles River Watershed, the Alternative 4 footprint is considerably smaller (see Figure 4.11-1); therefore, impacts would be reduced. As described in Section 4.11.3.3, hydrology and surface water body impacts from Alternative 4 would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 4. Under NEPA, Alternative 4 would not result in adverse effects to hydrology and surface water bodies and mitigation would not be required.

Water Quality

The potential for water quality impacts from the Alternative 4 facilities is similar to Alternative 1, as described in Section 4.11.3.3. The level of water quality impacts would be less than Alternatives 1, 2, and 3 because the project footprint and total disturbed areas are smaller and the alignment is shorter. As summarized in Table 4.11.3, the total disturbed area for Alternative 4 is 83.8 acres. When compared with the existing impervious surface area, 3.4 acres would be converted from impervious area to pervious area based on the construction of pavement, rooftops, and other hard surfaces. Impacts to water quality from rail operations can be generally quantified by length of track. Table 4.11.4 summarizes the length of each type of rail alignment (aerial, at-grade, and below-grade).

In the Los Angeles and San Gabriel River Watersheds, the Alternative 4 facilities are the same as Alternative 1 (see Section 4.11.3.3 and Figure 4.11-1). Therefore, impacts to water quality in this watershed would be similar to those at the same facilities for Alternative 1 within the watershed. Within the Los Angeles River Watershed, the Alternative 4 footprint is considerably smaller; therefore, impacts to water quality would be reduced. As described in Section 4.11.3.3, project impacts to water quality would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 4. Under NEPA, Alternative 4 would not result in adverse effects to water quality and mitigation would not be required.

Floodplains

The potential for floodplain impacts from the Alternative 4 facilities is similar to Alternative 1, as described in Section 4.11.3.3. The level of floodplain impacts would be less than Alternative 1 because the project footprint and total disturbed areas are smaller.

In the San Gabriel Watershed, the Alternative 4 facilities are the same as Alternative 1 (see Section 4.11.3.3 and Figure 4.11-1). Therefore, impacts to the San Gabriel River floodplain would be similar to those at the same facilities for Alternative 1 within the watershed. Alternative 4 would not cross the Rio Hondo or the Los Angeles River; therefore, Alternative 4 would not affect these floodplains. As described in Section 4.11.3.3, project impacts would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 4. Under NEPA, Alternative 4 would not result in adverse effects to floodplains and mitigation would not be required.

Groundwater

The potential for groundwater impacts from the Alternative 4 facilities is similar to Alternative 1, as described in Section 4.11.3.3. The level of groundwater impacts would be less than Alternative 1 because the project footprint and total disturbed areas are smaller and there are no tunnel sections. As summarized in Table 4.11.3, the total disturbed area for Alternative 4 is 83.8 acres. When compared with the existing impervious surface area, 3.4 acres would be converted from impervious area to pervious area based on the construction of pavement, rooftops, and other hard surfaces.

In the Central Basin, the Alternative 4 facilities are the same as Alternative 1 (see Section 4.11.3.3 and Figure 4.11-1). Therefore, impacts to groundwater would be similar to those at the same facilities for Alternative 1. As described in Section 4.11.3.3, groundwater impacts from Alternative 4 would be avoided or minimized through implementation of the design features described in Section 4.11.3.1; these same features would be implemented for Alternative 4. Under NEPA, Alternative 4 would not result in adverse effects to groundwater and mitigation would not be required.

4.11.3.7 Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station

Hydrology and Surface Water Bodies: Design Options 1 and 2 are substantially similar to Alternative 1 in regard to water resources conditions, potential impacts, and effect determinations. Therefore, conclusions provided for Alternative 1 are also applicable to the design options. Under NEPA, Design Options 1 and 2 would not result in adverse effects to hydrology and surface water bodies.

Water Quality: Design Options 1 and 2 would be substantially similar to Alternative 1 in regard to effects to water quality. Therefore, the conclusions provided for Alternative 1 are also applicable to the design options. Under NEPA, Design Options 1 and 2 would not result in adverse effects to water quality.

Floodplains: Design Options 1 and 2 are outside of the regulatory floodplains. Under NEPA, they would not generate floodplain impacts, and no adverse effects would occur.

Groundwater: Design Options 1 and 2 are substantially similar to Alternative 1 in regard to groundwater conditions, potential impacts, and effect determinations. Therefore, the conclusions provided for Alternative 1 are also applicable to the design options. Under NEPA, Design Options 1 and 2 would not result in adverse effects to groundwater.

4.11.3.8 Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options

Hydrology and Surface Water Bodies: The potential for hydrology and surface water body impacts from the Paramount and Bellflower MSF site options would be due to changes in impervious surface. While the MSFs are not immediately adjacent to surface waters, the Paramount MSF is located in the Los Angeles River Watershed and the Bellflower MSF is located in the Los Cerritos Channel Subwatershed of the San Gabriel River Watershed. The change in impervious area related to the MSFs is provided in Table 4.11.5. To minimize impacts to hydrology and water bodies from MSFs, the Build Alternatives would implement the design features discussed in Section 4.11.3.1 and would maintain pre-development hydrology characteristics. The Build Alternatives would comply with the post-construction and hydromodification requirements of the LA County MS4 NPDES permit, as discussed in Section 3 of the Water Resources Impact Analysis Report (Appendix T). New or modified storm drainage systems would be designed to meet local and regional standards. Under NEPA, no adverse effects to hydrology and surface water bodies from the MSF would occur, regardless of facility location.

Table 4.11.5. Maintenance and Storage Facility Change in Impervious Area

Component	Watershed	Total Disturbed Area (acres)	Existing Impervious Area (acres)	Proposed Impervious Area (acres)	New Impervious Area[1] (acres)
Bellflower MSF	Los Angeles River, Ballona Creek, San Gabriel River	21.5	8.8	21.5	12.7
Paramount MSF	Los Angeles River, San Gabriel River	22.2	20.9	22.2	1.3

Source: Metro 2021d
Notes: [1] New Impervious Area is the conversion of existing pervious (unpaved) areas to impervious area.
MSF = maintenance and storage facility

Water Quality: Development of an MSF at the Bellflower or Paramount site option would result in water quality impacts due to the new impervious surfaces required. Conversion of pervious to impervious area decreases infiltration, which increases the concentration and total pollutant load in stormwater runoff. In addition to new impervious surfaces, the maintenance and storage activities are expected to increase pollutant loads for pollutants

associated with industrial activities, such as sediment, nutrients, trash, metals, oil and grease, pesticides, and organics (CASQA 2003). However, design features discussed in Section 4.11.3.1 would be implemented to minimize direct impacts to water quality associated with MSFs. Under NEPA, the Paramount and Bellflower MSF site options would not result in adverse effects related to water quality.

Floodplains: Potential MSFs at Bellflower or Paramount are located outside of the 100-year flood zone. Under NEPA, the Paramount and Bellflower MSF site options would not result in adverse effects related to floodplains.

Groundwater: The Bellflower and Paramount MSF site options are outside of groundwater recharge areas. Under NEPA, no adverse effects to these groundwater recharge facilities would occur as a result of either MSF site option.

4.11.4 Project Measures and Mitigation Measures

With implementation of the design features described in Section 4.11.3.1, operation and maintenance of the Build Alternatives would not result in adverse effects to water resources; therefore, additional project and mitigation measures are not required.

4.11.5 California Environmental Quality Act Determination

4.11.5.1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

No Project Alternative

Under the No Project Alternative, implementation of the Build Alternatives would not be introduced into the Affected Area for water resources, and no changes or impacts consistent with the Build Alternatives would occur. Therefore, there would be no impacts to surface or groundwater quality and mitigation would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

As described in Section 4.11.3, the Build Alternatives would result in new impervious areas that could increase the concentration and total load of pollutants in stormwater runoff. Additionally, rail operations would contribute pollutants in concentrations and amounts that are typical for transportation facilities, including total suspended solids, metals, oil and grease, and debris. Impacts to water quality from rail operations can be generally quantified by length of track. As described in Section 4.11.3, the Build Alternatives would be subject to the LA County MS4 NPDES permit and IGP during the operational phase. The MS4 NPDES permit requires implementation of site design, source control, and treatment control BMPs to the maximum extent practical. The IGP requires preparation of an industrial SWPPP and a monitoring plan for industrial facilities, including vehicle maintenance facilities associated with transportation operations. With implementation of the design features described in Section 4.11.3.1, the Build Alternatives would not result in adverse effects to water quality; therefore, mitigation would not be required.

4.11.5.2 Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced and no changes to groundwater resources consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts to groundwater recharge and mitigation would not be required.

Build Alternatives, Design Option, and Maintenance and Storage Facilities

The Build Alternatives would result in 3.4 to 14.9 acres of new impervious area, as shown in Table 4.11.3 depending on the alternative, within the Central Basin. In addition, the Bellflower and Paramount MSF site options would result in 12.7 and 1.3 acres of new impervious area within the Central Basin, respectively, as shown in Table 4.11.5. Groundwater recharge within the Central Basin is primarily from spreading grounds and over land surfaces. In comparison, the entire basin is 177,000 acres (DWR 2004). Spreading grounds are located along the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River. The Rio Hondo Coastal Basin Spreading Grounds are 3.5 miles northeast of the Rio Hondo Channel crossing. The Dominguez Gap Spreading Grounds are approximately 6 miles south of the Los Angeles River crossing. The San Gabriel Coastal Basin Spreading Grounds are approximately 5 miles north of the San Gabriel River crossing. These facilities are outside of the Affected Area for water resources; therefore, no significant impacts to these groundwater recharge facilities from the Build Alternatives would occur. Direct precipitation on the basin within the Affected Area for water resources is not a major source of groundwater recharge. However, groundwater recharge could be impeded if a substantial amount of pervious area were converted to impervious surfaces. The increase in impervious surfaces within the Affected Area for water resources would be a negligible fraction of the entire aquifer area and would not impact the spreading grounds; therefore, it would not significantly affect groundwater recharge.

To minimize the impacts of new impervious area, the Project would comply with the post-construction and hydromodification requirements of the LA County MS4 NPDES permit, as discussed in Section 3.3 of the Water Resources Impact Analysis Report (Appendix T) and would implement the design features discussed in Section 4.11.3.1. These design features include LID treatment controls, such as landscaping, to help offset the loss of permeable surfaces. Furthermore, most recharge to the groundwater supply in LA County comes from large, natural stream systems or constructed groundwater recharge basins, which would be minimally affected by the Project. Therefore, impacts to groundwater resources would be minimized and the Build Alternatives would not result in adverse effects to groundwater.

With implementation of the Build Alternative design features described in Section 4.11.3.1, operations of the Build Alternatives, MSF, and design options would not substantially degrade groundwater quality, substantially interfere with groundwater recharge, or deplete groundwater resources. Therefore, the impacts would be less than significant, and mitigation would not be required.

Further, as discussed in Section 4.10.3 in the Hazards and Hazardous Materials Section of this Draft EIS/EIR, sites with known groundwater contamination are present within the Affected Area for water resources of Alternatives 1, 2, 3, and 4, Design Options 1 and 2, and the Paramount MSF site option. Depending on the alternative selected for implementation and the final design of the Project, it may be necessary to implement long-term groundwater monitoring or dewatering during operation. For example, tunnels may be placed in locations where long-term groundwater dewatering is necessary to prevent tunnel flooding. If this location also corresponds to a known groundwater release site, the dewatering activity would also need to include the handling of contaminated groundwater. If long-term groundwater monitoring or dewatering is necessary at a location where groundwater has been contaminated by hazardous materials, groundwater dewatering would affect operation of the Project by requiring ongoing management or treatment. This would be an adverse effect during operation.

Should long-term contaminated groundwater dewatering be necessary, HAZ PM-2 (Disposal of Groundwater [Operation]) would be implemented. This measure requires LARWQCB consultation and permit compliance, which may include water disposal to the sanitary sewer or the proper onsite management of contaminated groundwater and disposal or recycling of contaminated groundwater offsite at appropriate waste management facilities. With implementation of this project measure, no adverse effects related to groundwater monitoring or dewatering would occur during operation.

4.11.5.3 Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation onsite or offsite?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced and no changes consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts to drainage patterns in a manner that would result in substantial erosion or siltation, and mitigation would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

The Build Alternatives would require site grading. While there would be an overall increase in impervious surfaces, the increase would not substantially alter drainage patterns. Storm drains would be modified as needed, but the existing topography would be retained and the existing storm drainage systems preserved as much as possible. Therefore, the existing drainage pattern of the site and its surroundings would not be changed in a manner that would result in significant erosion or siltation onsite or offsite. Implementation of the Build Alternatives would not substantially increase runoff that could contribute to exceedance of the capacity of stormwater drainage systems. With implementation of the design features described in Section 4.11.3.1, the Build Alternatives would not affect drainage patterns in a manner that would result in substantial erosion or siltation. Therefore, the impact would be less than significant, and mitigation would not be required.

4.11.5.4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced and no changes consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts to drainage patterns in a manner that would result in flooding, and mitigation would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

The Build Alternatives would require site grading and an overall increase in impervious surfaces. Storm drains would be modified as needed, and existing storm drainage systems would be preserved as much as possible for use during project operation. The existing topography within the area would be retained and drainage patterns would be preserved as much as possible. To minimize the impacts of new impervious area, the Build Alternatives would implement the design features discussed in Section 4.11.3.1 and would maintain pre-development hydrology characteristics. The Build Alternatives would comply with the post-construction and hydromodification requirements of the LA County MS4 NPDES permit, as discussed in Section 3 of the Water Resources Impact Analysis Report (Appendix T). New or modified storm drainage systems would be designed to meet local and regional standards. Therefore, the Build Alternatives would not substantially increase the rate or amount of runoff from the project site that could cause flooding on- or offsite; impacts would be less than significant, and mitigation would not be required.

4.11.5.5 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced, and no changes consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts to drainage patterns in a manner that would contribute to exceedance of the capacity of the stormwater drainage systems or that would provide substantial additional sources of polluted runoff; therefore, mitigation would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

The Build Alternatives would not substantially alter drainage patterns or stream courses or substantially increase runoff that would contribute to exceedance of the capacity of stormwater drainage systems, as described in Section 4.11.3. The Build Alternatives would also not provide additional sources of polluted runoff. With implementation of the design features described in Section 4.11.3.1, the Build Alternatives would not result in adverse effects related to stormwater runoff. Therefore, this impact would be less than significant, and mitigation would not be required.

4.11.5.6 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through addition of impervious surfaces, in a manner which would impede or redirect flood flows?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced, and no changes consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts to drainage patterns in a manner that would impede or redirect flood flows, and mitigation would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

The Build Alternatives would cross three major flood-control channels, each with FEMA-established floodplains: the Los Angeles River, the Rio Hondo Channel, and the San Gabriel River. New bridges with piers or columns would be constructed within each of these flood-control channels. While each crossing would result in some change to the water surface elevation in each channel, changes to the water surface elevation at each river crossing are anticipated to be minor.

The floodplains are protected by existing levees or channel walls. The Project would not alter the ability of the channel to convey 100-year flows, and there would be negligible change to the floodplain extents. In addition, tracks and aerial structures associated with the Build Alternatives would be built above the existing river channel walls or levees. Therefore, floodplain impacts would be minimized to the greatest extent practicable.

Long-term indirect impacts to floodplains would be unlikely as a result of the Build Alternatives because the floodplains are protected by levees and the surrounding areas are already urbanized.

With implementation of the design features described in Section 4.11.3.1, the Build Alternatives are not expected to impede or redirect flood flows; impacts would be less than significant; and mitigation is not required.

4.11.5.7 In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced, and no changes consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts on flood, tsunami, or seiche zones that would increase the risk of pollution due to inundation, and mitigation would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

Alternatives 1, 2, and 3 would construct new bridges across the Los Angeles River and the Rio Hondo Channel, while all four Build Alternatives would construct new bridges at the San Gabriel River. New bridge deck structures would be built above the existing river channel walls or levees, with new bridge piers or columns built within the channels. Location hydraulic studies were prepared to evaluate the Build Alternatives' impacts to each river (Metro 2017a; 2017b; and 2017e). The new bridges would raise the water surface elevation within the channel; however, the Build Alternatives would not alter the ability of the channel to convey the 100-year flows and there would be a negligible change to the floodplain extents.

Therefore, the Build Alternatives are not at risk to release pollutants due to project inundation and impacts would be less than significant. Additionally, the project alignment would be located more than 20 miles from the ocean and, therefore, would not be within areas potentially affected by seiches or tsunamis. As a result, impacts associated with these events would not occur. The Build Alternatives would not result in adverse effects related to pollutant releases due to inundation; therefore, impacts would be less than significant and mitigation would not be required.

4.11.5.8 Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be introduced, and no changes consistent with the Build Alternatives would occur within the Affected Area for water resources. Therefore, there would be no impacts to implementation of a water quality control plan or sustainable groundwater management plan, and mitigation measures would not be required.

Build Alternatives, Design Options, and Maintenance and Storage Facilities

Operation and maintenance activities of the Build Alternatives, MSF, and Design Options 1 and 2 could increase pollutant discharges to stormwater and/or groundwater that are typical for rail facilities (e.g., oils and grease, metals, solvents, pesticides). The Build Alternatives would be subject to the IGP and the LA County MS4 NPDES permit during the operational phase and the CGP during the construction phase, each pursuant to the Los Angeles Basin Plan. The MS4 NPDES permit requires implementation of site design, source control, and treatment control BMPs to the maximum extent practical. The stormwater IGP (Order No. 2014-0057-DWQ) requires preparation of an industrial SWPPP and a monitoring plan for industrial facilities, including the MSF. Compliance with these permits would be required by the LARWQCB as a condition of approval of the Section 401 Water Quality Certification or as conditions of various NPDES permits prior to implementation. Further, all phases of construction would be subject to the CGP. The Build Alternatives are located within the Central Basin, which is an adjudicated basin and, therefore, not required to develop a groundwater management plan. The Central Basin is actively managed by WRD and subject to annual reporting for monitoring of groundwater levels and quality to confirm proper resource management. Therefore, the Build Alternatives would not obstruct implementation of a water quality control plan or sustainable groundwater management plan; impacts would be less than significant; and mitigation would not be required.

4.12 Energy

This section summarizes the energy consumption under existing conditions and the 2042 future year No Build and Build Alternatives, including design options and MSF site options, and the potential adverse effects and impacts on energy resources. Information in this section is based on the *West Santa Ana Branch Transit Corridor Project Final Energy Impact Analysis Report* (Metro 2021h) (Appendix U).

4.12.1 Regulatory Setting and Methodology

4.12.1.1 Regulatory Setting

Federal

Council on Environmental Quality (CEQ) (40 CFR § 1502.16 Environmental Consequences): CEQ regulations § 1502.16 outlines the discussion of environmental consequences and the scientific and analytical basis for comparing alternatives within an EIS under NEPA. 40 CFR § 1502.16(a)(6) states that discussions of environmental consequences in an EIS when comparing alternatives shall include energy requirements and conservation potential of various alternatives and mitigation measures.

Executive Order 13834: Established goals for energy efficiency improvements.

Energy Policy Act of 2005: The Energy Policy Act promotes alternative fuels and advanced vehicles' production and use. This Act amends existing regulations, including fuel economy testing procedures and Energy Policy Act of 1992 requirements for federal, state, and alternative fuel provider fleets.

Energy Independence and Security Act of 2007: This Act consists of provisions to increase energy efficiency and the availability of renewable energy through the Corporate Average Fuel Economy and the Renewable Fuels Standard.

State

EO B-30-15: EO B-30-15 established state GHG emission targets to reduce GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

California Code of Regulations, Energy Efficiency Standards: Energy consumption of new buildings in California is regulated by State Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 2, Chapter 2-53. Title 24 applies to all new construction of both residential and nonresidential buildings, and regulates energy consumed for heating, cooling, ventilation, water heating, and lighting.

California Transportation Plan: This statewide, long-range transportation plan defines performance-based goals, policies, and strategies to achieve an integrated, multimodal transportation system. Strategies to achieve maximum feasible emissions reductions include alternative fuels, new vehicle technology, and tailpipe emissions reductions.

Assembly Bill 1493: AB 1493 amended the Clean Car Standards (Chapter 200, Statutes of 2002) that require reductions in GHG emissions in new passenger vehicles from 2009 through 2016. The Advanced Clean Cars program extends AB 1493 for model years 2017 to 2025. This program promotes clean fuel technologies (i.e., plug-in hybrids, battery electric vehicles, compressed natural gas vehicles, hydrogen powered vehicles), reduces smog, and provides fuel cost savings.

Senate Bill 743: SB 743 encourages land use and transportation planning decisions and investments to reduce VMT that contribute to GHG emissions, as required by AB 32. SB 743 requires the Office of Planning Research to develop revisions to the *CEQA Guidelines* and establish criteria to determine the significance of transportation impacts of projects within transit priority areas.

SB 350: SB 350 established a 2030 GHG reduction target of 40 percent below 1990 levels and sets targets for energy efficiency and renewable electricity, among other actions aimed at reducing GHG emissions across the energy and transportation sectors.

SB 375: SB 375 addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required the CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, and task regional metropolitan planning organizations with the preparation of sustainable communities strategies within their regional transportation plans. The SCAG 2016-2040 RTP/SCS (SCAG 2016a) includes a commitment to reduce emissions from transportation sources to comply with SB 375. The *2016-2040 RTP/SCS* states that the region will meet or exceed the SB 375 per capita targets, lowering regional per capita GHG emissions to 8 percent below 2005 per capita emissions levels by 2020, 18 percent below by 2035, and 22 percent below by 2040.

SB X1-2 and SB 250: SB X1-2 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB 250 requires retail seller and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030.

Regional and Local

Metro Energy Conservation and Management Plan (ECMP) (Metro 2011a): The ECMP complements Metro's 2007 *Energy and Sustainability Policy* (Metro 2007), focusing on electricity for rail vehicle propulsion, electricity, and natural gas for rail and bus facility purposes, and the application of renewable energy.

Additional applicable regional and local plans, policies, and regulations regarding energy include the SCAG 2016-2040 RTP/SCS (SCAG 2016a), the *Metro Energy and Sustainability Policy* (Metro 2007), the *Metro Climate Action and Adaptation Plan* (Metro 2019a), the *Metro Sustainable Rail Plan* (Metro 2013b), the *Metro Moving Beyond Sustainability Strategic Plan 2020* (Metro 2020f), and the *Los Angeles Department of Water and Power Strategic Long-Term Resource Plan* (LADWP 2017).

4.12.1.2 Methodology

The assessment of potential energy impacts associated with the Project considers the Affected Area for energy to be the geographic region served by the energy resource suppliers for electricity and natural gas: the LADWP and Southern California Edison (SCE) service areas for electricity and the Southern California Gas Company (SoCalGas) service area for natural gas. The transportation fuels analysis for regional on-road vehicle travel considers the SCAG region to be the Affected Area for energy.

The operational analysis considers direct energy consumption from electricity used to power the transit system and operations at the MSF, as well as indirect energy consumption resulting from changes in overall regional on-road VMT. Energy resource expenditures that were quantified for each analytical scenario include: direct electricity consumption associated

with rail vehicle propulsion and track and station operations; direct electricity and natural gas consumption associated with MSF operations; direct fossil fuel consumption associated with MSF operations vehicle trips; indirect electricity associated with the provision of water resources at the MSF; and indirect changes in regional transportation fuels consumption spurred by displaced vehicle trips from transit ridership.

Table 4.12.1 presents a summary of the annual LRT operating miles for the project corridor under each alternative and the corresponding regional VMT on the roadway network that were used to estimate direct rail propulsion and facility operations electricity consumption and indirect transportation fuels consumption, respectively. The LRT miles displayed include anticipated annual LRT miles traveled during revenue service hours when the system would be transporting passengers and accounts for a 5 percent buffer adjustment for miles traveled when trains are out of service.

Table 4.12.1. Countywide Vehicle Miles Traveled and Project Corridor LRT Revenue Miles

	Condition/Alternative	Regional Roadway VMT (annual, millions)	LRT Miles (annual)
CEQA Existing Baseline Year 201	Existing	160,746	N/A
	Existing + Alternative 1	160,671	2,109,180
	Existing + Alternative 2	160,672	2,120,399
	Existing + Alternative 3	160,734	1,604,323
	Existing + Alternative 4	160,721	706,800
	Existing + Design Option 1	160,664	2,109,180
	Existing + Design Option 2	160,670	2,109,180
NEPA/CEQA Future Baseline Year 2042 [1]	No Build Alternative	210,396	N/A
	Alternative 1	210,261	2,109,180
	Alternative 2	210,266	2,120,399
	Alternative 3	210,372	1,604,323
	Alternative 4	210,351	706,800
	Design Option 1	210,245	2,109,180
	Design Option 2	210,258	2,109,180

Source: Metro 2021j
Notes: [1] *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th 439 held that use of dual baselines is appropriate under CEQA provided that one is the existing baseline. The CEQA analysis utilizes the Existing Baseline Year 2017 and a Future Baseline Year 2042.
A 5 percent buffer was added to revenue LRT car mile estimates to account for out-of-service miles.
CEQA = California Environmental Quality Act; LRT = light rail transit; N/A = Not Applicable; NEPA = National Environmental Policy Act; VMT = vehicle miles traveled

Energy intensity factors obtained from the *2017 Metro Energy and Resource Report* (Metro 2017c) were used to estimate direct LRT and station operation electricity consumption for the No Build, Build Alternatives, and Design Options. Energy intensity factors relate energy inputs (British thermal units (BTUs) consumed) to resulting output (miles traveled). Across its system, Metro estimates that for every mile of LRT travel, approximately 6,635 BTUs (7

megajoules) of electricity is consumed. This energy intensity factor was applied to the LRT miles presented in Table 4.12.1 to estimate annual LRT propulsion energy consumption.

For the purposes of this analysis, energy intensity related to on-road vehicle travel is defined as the ratio of energy inputs to the useful outputs from that process (e.g., gallons of fuel per passenger-mile). The CARB EMFAC2017 mobile source emissions model provides estimates of gallons of gasoline or diesel fuel burned per mile traveled for a given year, vehicle fleet mix, and speed. Generally, traffic in the Affected Area for energy is assumed to be approximately 7 percent trucks based on the Metro regional model. Annual indirect on-road vehicle travel fuel consumption was estimated using the annual VMT data organized by speed bins of 5-mph increments and the corresponding EMFAC2017 fuel consumption factors for the on-road vehicle fleet traveling at the designated speeds. The annual roadway network VMT energy consumption was estimated using the fuel energy content factors derived by the Alternative Fuels Data Center (United States Department of Energy 2014): approximately 118,223 BTU per gallon gasoline and approximately 133,489 BTU per gallon diesel.

In addition to direct electricity associated with project corridor rail propulsion and facility operations and indirect changes to regional on-road transportation fuels consumption, the assessment of potential impacts related to energy consumption analyzed direct and indirect energy associated with operation of the MSF. The California Emissions Estimator Model (CalEEMod, version 2016.3.2) is the preferred land use development emissions model for use in California. CalEEMod was used to estimate direct electricity and natural gas consumption associated with MSF operations, direct transportation fuels consumption associated with MSF vehicle trips, and indirect electricity consumption associated with water conveyance to and from the MSF.

4.12.2 Affected Environment/Existing Conditions

4.12.2.1 State

California consumes more energy than any other state except Texas but ranks 49th among the 50 states and the District of Columbia for energy consumption per person (SCAG 2016a). Current annual energy consumption in California (including transportation) is approximately 7,830 trillion BTUs, or approximately 8.0 percent of the nation's energy consumption. California's energy consumption comprises 17.7 percent residential sector uses, 18.9 percent commercial sector uses, 23.7 percent industrial sector uses, and 39.8 percent transportation sector uses. Natural gas and gasoline are the most consumed resources and account for 28.7 percent and 21.9 percent of all statewide energy consumption, respectively.

4.12.2.2 Regional

Transportation accounts for approximately 59 percent of all energy use in SCAQMD jurisdiction, followed by residential energy consumption at 17 percent (SCAQMD 2017). According to the SCAG 2016-2040 RTP/SCS, approximately 417.7 million miles per day were traveled in 2016 and approximately 453.8 million miles per day are expected to be traveled under the 2040 plan conditions (SCAG 2016a). This would result in an overall increase in transportation energy use within the SCAG region due to fuel combustion from on-road vehicles. A reduction in VMT due to the implementation of alternative modes of transportation could reduce energy use within the region.

4.12.2.3 Local

Metro's contribution to regional energy consumption includes on-road vehicle fuel use (primarily compressed natural gas) and electricity for rail vehicle propulsion and maintenance and administrative facility operation. The *2017 Energy and Resource Report* (Metro 2017c) examined Metro energy use for the 2016 calendar year. Table 4.12.2 presents the Metro system energy consumption by end use between 2012 and 2016. In total, rail propulsion resulted in the consumption of approximately 207,921,473 kilowatt hours (kWh) of energy in the year 2016.

Table 4.12.2. Metro Energy Consumption

End Use	2012	2013	2014	2015	2016
Vehicle Fuel (GGE)	42,490,623	43,930,100	44,710,242	43,995,037	42,995,037
Rail Propulsion (kWh)	199,093,552	229,866,746	210,937,940	198,921,473	207,921,473
Facility Energy (kWh)	97,500,044	90,099,301	94,144,097	116,146,856	119,148,856

Source: Metro 2017
Note: GGE = gasoline gallon equivalent; kWh = kilowatt hours

Electricity consumed by project facilities would be provided by LADWP and SCE, and natural gas consumed at the MSF would be provided by SoCalGas.

LADWP: LADWP serves an area covering 465 square miles that includes over 4 million residents and 1.4 million power customers. As of 2016, energy sources consisted of 29 percent natural gas, 29 percent renewable sources, 19 percent coal, 9 percent nuclear, 6 percent unspecified sources, and 3 percent hydroelectric resources. Total daily generation capacity is over 7,880 megawatts (LADWP 2016). According to California Energy Commission (CEC) data, LADWP customers consumed a total of approximately 25,135,339 megawatt hours of electricity in 2016. Metro's 2016 systemwide electricity consumption was equivalent to approximately 1.3 percent of total annual LADWP consumption.

SCE: SCE serves an area of 50,000 square miles, including 15 million people, 180 incorporated cities, and 15 counties. In 2015, SCE delivered more than 87 billion kWh of electricity to its service area (SCE 2018). In 2016, SCE energy sources consisted of 41 percent unspecified sources, 28 percent renewable sources, 19 percent natural gas, 6 percent hydroelectric, and 6 percent nuclear (CEC 2017). According to CEC data, SCE customers consumed approximately 102,319,743 megawatt hours of electricity in 2016. Metro's 2016 systemwide electricity consumption was equivalent to approximately 0.3 percent of total annual SCE consumption.

SoCalGas: SoCalGas is the primary provider of natural gas to the Southern California region. In 2016, SoCalGas customers consumed approximately 7,258,720,922 Therms of natural gas energy according to the CEC database. Metro 2016 operations consumed approximately 1,005,242 Therms of natural gas through facilities and approximately 48,281,943 Therms of natural gas through the bus fleet. Total annual Metro natural gas consumption represents less than 1 percent of SoCalGas customers.

4.12.3 Environmental Consequences/Environmental Impacts

4.12.3.1 No Build Alternative

The No Build Alternative includes planned infrastructure and transportation-related projects but would exclude the facilities and infrastructure of the Build Alternatives that would increase energy consumption or require energy infrastructure to meet project demands. Energy use for the No Build Alternative is best represented in terms of transportation energy and regional VMT. The No Build Alternative includes general population growth that would lead to increased vehicle use and energy consumption. The No Build Alternative VMT also accounts for the existing transit system and related future projects, including projects affecting the regional transportation system (e.g., highway widening). Annual VMT in the region would increase from approximately 463 million VMT (2018) to approximately 606 million VMT (2042) (Metro 2021h). However, as alternative-fueled passenger vehicles (e.g., electric and natural gas) are added to the fleet and fuel efficiency improves, aggregate average fleetwide fuel consumption per mile traveled for cars would decline.

CARB EMFAC2017 mobile source emissions model provides fuel consumption factors based on vehicle type, year, and speed. Table 4.12.3 shows energy use for the existing condition and the No Build Alternative based on regional on-road VMT. The No Build Alternative would result in 11.0 percent less transportation energy use than the existing condition and would not introduce additional energy consumption in 2042. Under NEPA, the No Build Alternative would not result in adverse effects related to operational energy consumption.

Table 4.12.3. No Build Alternative Operational Energy Consumption Based on VMT

Existing (2017) (annual MMBTU)	No Build Alternative (2042) (annual MMBTU)	Percent Change
907,145,388	807,680,340	-11.0%

Source: Metro 2021h
Note: MMBTU = million British thermal units; VMT = vehicle miles traveled

4.12.3.2 Alternative 1: Los Angeles Union Station to Pioneer Station

Alternative 1 would directly result in the consumption of energy related to the LRT propulsion systems, lighting and accessory equipment at station platforms, and operation of the MSF (i.e., electricity and natural gas). Alternative 1 consists of 19.3 miles of alignment and includes 11 stations. Electricity would be provided to the LRT line by TPSS units and to stations by traditional distribution connection facilities (e.g., power poles, underground wires, and transmission lines). Alternative 1 would indirectly change regional energy consumption through changes in regional VMT. As shown in Table 4.12.4, Alternative 1 would reduce annual regional energy consumption from the No Build Alternative by 626,621 million BTU (MMBTU) (0.08 percent net reduction). The reduction in regional energy consumption represents a conservation potential of 626,621 MMBTU annually relative to the No Build Alternative, and the reduction is consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources. Although implementation of Alternative 1 would involve construction of power poles, transmission lines, and connections to the existing grid, it would not require the expansion of existing generation facilities and would not interfere with LADWP and SCE efforts to augment renewable energy supply. Under NEPA, Alternative 1 would not result in an adverse effect related to operational energy consumption.

Table 4.12.4. Operational Energy Consumption under the Build Alternatives (2042)

Component	Annual Energy Consumption (in MMBTU)						
	No Build	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Design Option 1	Design Option 2
Roadway VMT	807,680,340	807,032,073	807,143,051	807,539,033	807,548,369	806,997,571	807,040,451
LRT/Station energy	-	13,994	14,068	10,644	4,689	13,994	13,994
MSF[1]	-	7,652	7,652	7,652	7,652	7,652	7,652
Total Energy	**807,680,340**	**807,053,719**	**807,164,771**	**807,557,329**	**807,560,710**	**807,019,217**	**807,062,097**
Change from No Build Alternative	**-**	**(626,621)**	**(515,569)**	**(123,011)**	**(119,630)**	**(661,123)**	**(618,243)**
Percent Change from No Build	**-**	**(0.08%)**	**(0.06%)**	**(0.02%)**	**(0.01%)**	**(0.08%)**	**(0.08%)**

Source: Metro 2021h
Notes: [1] The Paramount MSF site option would consume approximately 7,652 MMBTU annually, and the Bellflower MSF site option would consume approximately 6,912 MMBTU annually. For simplicity, the higher MSF energy consumption associated with the Paramount MSF site option is shown.
LRT = light rail transit; MMBTU = million British thermal units; MSF = maintenance and storage facility; VMT = vehicle miles traveled; ( ) = decrease/reduction

4.12.3.3 Alternative 2: 7th Street/Metro Center to Pioneer Station

The direct and indirect consumption of energy for Alternative 2 would be the same as Alternative 1. Alternative 2 consists of 19.3 miles of alignment and includes 12 stations. As shown in Table 4.12.4, Alternative 2 would reduce regional energy consumption from the No Build Alternative by 515,569 MMBTU (0.06 percent net reduction). The reduction in regional energy consumption represents a conservation potential of 515,569 MMBTU annually relative to the No Build Alternative, and the reduction is consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources. Although implementation of Alternative 2 would involve construction of power poles, transmission lines, and connections to the existing grid, it would not require the expansion of existing generation facilities and would not interfere with LADWP and SCE efforts to augment renewable energy supply. Under NEPA, Alternative 2 would not result in an adverse effect related to operational energy consumption.

4.12.3.4 Alternative 3: Slauson/A (Blue) Line to Pioneer Station

The direct and indirect consumption of energy for Alternative 3 would be the same as the other Build Alternatives. Alternative 3 consists of 14.8 miles of alignment and includes 9 stations. The shorter alignment would result in less VMT reduction from the No Build Alternative relative to Alternatives 1 and 2 and would also require less energy to operate the LRT corridor and stations. As shown in Table 4.12.4, Alternative 3 would reduce annual regional energy consumption from the No Build Alternative by 123,011 MMBTU (0.02 percent net reduction). The reduction in regional energy consumption represents a conservation potential of 123,011 MMBTU annually relative to the No Build Alternative, and the reduction is consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources. Although implementation of Alternative 3 would involve construction of power poles, transmission lines, and connections to the existing grid, it would not require the expansion of existing generation facilities and would not interfere with LADWP and SCE efforts to augment renewable energy supply. Under NEPA, Alternative 3 would not result in an adverse effect related to operational energy consumption.

4.12.3.5 Alternative 4: I-105/C (Green) Line to Pioneer Station

The direct and indirect consumption of energy for Alternative 4 would be the same as the other Build Alternatives. Alternative 4 consists of 6.6 miles of alignment and includes four stations. Similar to Alternative 3, the shorter alignment would result in less VMT reduction from the No Build Alternative and would also require less energy to operate the LRT and stations. As shown in Table 4.12.4, Alternative 4 would reduce annual regional energy consumption from the No Build Alternative by 119,630 MMBTU (0.01 percent net reduction). The reduction in regional energy consumption represents a conservation potential of 119,630 MMBTU annually relative to the No Build Alternative, and the reduction is consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources. Although implementation of Alternative 4 would involve construction of power poles, transmission lines, and connections to the existing grid, it would not require the expansion of existing generation facilities and would not interfere with LADWP and SCE efforts to augment renewable energy supply. Under NEPA, Alternative 4 would not result in an adverse effect related to operational energy consumption.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 1: (Add Little Tokyo Station

As shown in Table 4.12.4, compared to the No Build Alternative, Design Option 1 would reduce regional energy consumption from the No Build Alternative by 661,123 MMBTU (0.08 percent net reduction). Design Option 2 would reduce regional energy consumption from the No Build Alternative by 618,243 MMBTU (0.08 percent net reduction). The reductions in regional energy consumption for Design Options 1 and 2 represent annual conservation potentials of 661,123 MMBTU and 618,243 MMBTU relative to the No Build Alternative in 2042, respectively. The estimated reductions in regional energy consumption are consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources. Although implementation of the design options would involve construction of power poles, transmission lines, and connections to the existing grid, it would not require the expansion of existing generation facilities and would not interfere with LADWP and SCE efforts to augment renewable energy supply. Under NEPA, Design Options 1 and 2 would not result in an adverse effect related to operational energy consumption.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option

The Paramount and Bellflower MSF site options would be designed per the Metro Rail Design Criteria, constructed in compliance with mandatory Title 24 and the California Green Building Standards Code (CALGreen) requirements, and would achieve a minimum Silver rating under the Leadership in Energy and Environmental Design (LEED) certification, as specified in the ECMP.

The MSF site options would result in the consumption of fuels and electricity from the operation of facility equipment and vehicle trips to and from the site. As the MSF site option is a component of the Build Alternatives, energy consumption is accounted for in the overall analysis of the Build Alternatives. As shown in Table 4.12.4, it is estimated that the Paramount MSF site option would use approximately 7,652 MMBTU per year, and the Bellflower MSF site option would use approximately 6,912 MMBTU per year. The MSF site options would contribute to a net energy reduction by contributing to implementation of the LRT and the associated VMT reductions. The Paramount and Bellflower MSF site options would not constitute a wasteful, inefficient, or unnecessary consumption of energy. Under NEPA, the Paramount and Bellflower MSF site options would not result in an adverse effect related to operational energy consumption.

4.12.4 Project Measures and Mitigation Measures

No project or mitigation measures for energy effects would be required.

4.12.5 California Environmental Quality Act Determination

4.12.5.1 Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?

No Project Alternative

The No Project Alternative would not include the operation of any project-related facilities or infrastructure. Existing energy consumption of Metro facilities would remain unchanged. As of 2017, the Metro system comprised 129 million revenue miles consuming approximately 55.6 megajoules of energy per revenue mile, for a total of 7,172 million megajoules. On-road

vehicle fuel consumption accounts for approximately 80 percent of the systemwide energy use, and electricity for rail propulsion represents approximately 12 percent. Approximately 30 percent of Metro's electricity is generated by renewable sources. The No Project Alternative would not interfere with Metro's commitments to improving energy efficiency or expanding its alternative energy infrastructure, and would not create a wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, a significant impact would not occur, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

As described in Section 4.12.3.2 and shown in Table 4.12.4, Alternative 1 would reduce regional energy consumption from the No Build Alternative by 626,621 MMBTU in 2042 (a 0.08 percent net reduction). An additional analysis of the Existing + Alternative 1 scenario was completed to satisfy CEQA requirements. As shown in Table 4.12.5, Existing + Alternative 1 conditions would result in 156,597 MMBTU more energy consumption (a 0.02 percent increase) than Existing conditions. This increase would be negligible in the context of Metro systemwide annual energy consumption. Alternative 1 would not constitute a wasteful, inefficient, or unnecessary consumption of energy during project operation. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

As described in Section 4.12.3.3 and shown in Table 4.12.4, Alternative 2 would result in less energy use than the No Build Alternative (0.06 percent net decrease) as a result of decreased regional VMT and associated fuel use. As shown in Table 4.12.5, Existing + Alternative 2 conditions would result in 487,042 less MMBTU (an approximately 0.05 percent net reduction) than Existing conditions. Alternative 2 would not constitute a wasteful, inefficient, or unnecessary consumption of energy during project operation. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

As described in Section 4.12.3.4 and shown in Table 4.12.4, Alternative 3 would result in less energy use than the No Build Alternative (0.02 percent net decrease) as a result of decreased regional VMT and associated fuel use. As shown in Table 4.12.5, Existing + Alternative 3 conditions would result in 147,833 less MMBTU (a 0.02 percent net reduction) than Existing conditions. Alternative 3 would not constitute a wasteful, inefficient, or unnecessary consumption of energy during project operation. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

As described in Section 4.12.3.4 and shown in Table 4.12.4, Alternative 4 would result in less energy use than the No Build Alternative (0.01 percent net decrease) as a result of decreased regional VMT and associated fuel use. As shown in Table 4.12.5, Existing + Alternative 4 conditions would result in 98,425 less MMBTU (a 0.01 percent net reduction) than Existing conditions. Thus, Alternative 4 would not constitute a wasteful, inefficient, or unnecessary consumption of energy during project operation. Therefore, impacts would be less than significant, and mitigation would not be required.

Table 4.12.5. Operational Energy Consumption under Existing + Project Scenario

Component	Annual MMBTU (in MMBTU)						
	Existing	Existing + Alternative 1	Existing + Alternative 2	Existing + Alternative 3	Existing + Alternative 4	Existing + Design Option 1	Existing + Design Option 2
Regional VMT	907,145,388	907,280,339	906,636,626	906,979,259	907,034,622	906,441,037	906,723,046
LRT System	-	13,994	14,068	10,644	4,689	13,994	13,994
MSF[1]	-	7,652	7,652	7,652	7,652	7,652	7,652
Total Energy	**907,145,388**	**907,301,985**	**906,658,346**	**906,997,555**	**907,046,963**	**906,462,683**	**906,744,692**
Change Relative to Existing	**-**	**156,597**	**(487,042)**	**(147,833)**	**(98,425)**	**(682,705)**	**(400,696)**
Percent Change Relative to Existing	**-**	**0.02%**	**(0.05%)**	**(0.02%)**	**(0.01%)**	**(0.08%)**	**(0.04%)**

Source: Metro 2021h

Notes: [1] The Paramount MSF site option would consume approximately 7,652 MMBTU annually and the Bellflower MSF site option would consume approximately 6,912 MMBTU annually. For simplicity, the higher MSF site option estimate is shown.

LRT = light rail transit; MMBTU = million British thermal units; MSF = maintenance and storage facility; VMT = vehicle miles traveled; ( ) = decrease/reduction

Design Options—Alternative 1

Design Option 1: LAUS at MWD: As described in Section 4.12.3.4 and shown in Table 4.12.4, Alternative 1 with Design Option 1 would result in less energy use than the No Build Alternative (0.08 percent net reduction) as a result of decreased regional VMT and associated fuel use. As shown in Table 4.12.5, Existing + Design Option 1 conditions would result in 682,705 less MMBTU (a 0.08 percent net reduction) than Existing conditions. Design Option 1 would not constitute a wasteful, inefficient, or unnecessary consumption of energy during project operation. Therefore, impacts would be less than significant, and mitigation would not be required.

Design Option 2: Add Little Tokyo Station: As described in Section 4.12.3.4 and shown in Table 4.12.4, Alternative 1 with Design Option 2 would result in less energy use than the No Build Alternative (0.04 percent net reduction) as a result of decreased regional VMT and associated fuel use. As shown in Table 4.12.5, Existing + Design Option 2 conditions would result in 400,696 less MMBTU (0.04 percent net reduction) than Existing conditions. Design Option 2 would not constitute a wasteful, inefficient, or unnecessary consumption of energy during project operation. Therefore, impacts would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Paramount MSF Site Option: Operation of the Paramount MSF site option would result in the consumption of fuels and electricity from operation and vehicle trips and is a component of the Build Alternatives in which energy consumption is accounted for in the overall analysis of the Build Alternatives. As shown in Table 4.12.5, the Paramount MSF site option would use approximately 7,652 MMBTU per year, and the Bellflower MSF site option would use approximately 6,912 MMBTU per year. The MSF site options would contribute to a net energy reduction by contributing to implementation of the LRT and the associated VMT reductions. The Paramount MSF site option and Bellflower MSF site option would not constitute a wasteful, inefficient, or unnecessary consumption of energy. Therefore, the Paramount MSF site option and Bellflower MSF site option would not result in an adverse effect related to operational energy; impacts would be less than significant; and mitigation would not be required.

4.12.5.2 Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Project Alternative

The No Project Alternative would not include operation of any project-related facilities or infrastructure. As of 2017, approximately 30 percent of Metro's electricity is generated by renewable sources, and the seven Metro-owned solar installations around the greater Los Angeles area generated a total of 2,670 megawatt hours. Metro has a goal of 50 percent renewable energy use by 2030. Additionally, Metro operates 11 LEED-certified buildings representing nearly 2 million square feet of floor area. The No Project Alternative would not interfere with Metro's commitments to improving energy efficiency or expanding its alternative energy infrastructure; however, it would do the least of all the alternatives to support regional and local conservation plans in reducing VMT. Impacts would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

No state, regional, or local energy conservation plans promote increased passenger vehicles on the roadway network in place of mass transit. Alternative 1 would be consistent with the applicable regional and local conservation plans. Energy used for Alternative 1 operations would not be considered a wasteful or inefficient use of energy as mass transit and reduced VMT are key components of relevant energy conservation plans. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Similar to Alternative 1, Alternative 2 would be consistent with applicable regional and local conservation plans, and energy used for operation would not be considered a wasteful or inefficient use of energy. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Similar to Alternatives 1 and 2, Alternative 3 would be consistent with applicable regional and local conservation plans, and energy used for operation would not be considered a wasteful or inefficient use of energy. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Similar to Alternatives 1, 2, and 3, Alternative 4 would be consistent with applicable regional and local conservation plans, and energy used for operation would not be considered a wasteful or inefficient use of energy. Therefore, impacts would be less than significant, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Design Options 1 and 2 would be consistent with applicable regional and local conservation plans, and energy use for operation of Design Options 1 and 2 would not be considered a wasteful or inefficient use of energy as mass transit and reduced VMT are key components of relevant energy conservation plans. Therefore, impacts would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: The Paramount and Bellflower MSF site options are components of the Build Alternatives and would be consistent with the applicable regional and local conservation plans by contributing to implementation of a Build Alternative. Therefore, impacts would be less than significant and mitigation would not be required.

4.13 Electromagnetic Fields

This section summarizes the analysis of electromagnetic field (EMF) effects. EMF results from electromagnetic emissions, which is energy in the form of photons. Human-made EMF and associated electromagnetic interference (EMI) is produced when electric current travels through a circuit. The dominant source of EMF for LRT is the direct current (DC) electric traction system that powers the trains. Information in this section is based on the *West Santa Ana Branch Transit Corridor Project Final Electromagnetic Field Impact Potential Memorandum* (Metro 2021v) (Appendix V).

EMF has electrical and magnetic field components. The electric fields result from the strength of the electric charge (voltage). Magnetic fields result from the motion of the charge (current). Electric field strength is measured in units of volts per meter and is greater the higher the voltage. Magnetic field strength is measured in milligauss (mG).

4.13.1 Regulatory Setting and Methodology

4.13.1.1 Regulatory Setting

The federal government and State of California have not established regulatory limits for EMF exposure. The FTA has released *Guidance on the Prevention and Mitigation of Environmental, Health, and Safety Impacts of Electromagnetic Fields and Radiation for Electric Transit Systems* (FTA 2008). Regarding health effects, compliance with referenced consensus standards and guidelines is encouraged. The most relevant standard is "C95.6: IEEE [Institute of Electrical and Electronics Engineers] Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3 [kilohertz] kHz" (IEEE 2002). The C95.6 Standard establishes maximum permissible exposure (MPE) levels to protect the general public that vary by frequency. The MPE levels for frequencies between 1 and 20 Hertz (Hz) (where the majority of EMF from light rail vehicles is generated) ranges from 1,180,000 mG at static to 9,040 mG at 20 Hz. To avoid EMI with sensitive equipment, project-generated EMI should be below equipment-specific sensitivity thresholds.

4.13.1.2 Methodology

To evaluate potential effects on human health, EMF that would be generated by the Project was compared to the C95.6: IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3 kHz (IEEE 2002). The C95.6 Standard establishes MPE levels to protect the general public that vary by frequency. The MPE levels for frequencies between 1 and 20 Hz (where the majority of EMF from light rail vehicles is generated) ranges from 1,180,000 mG at static to 9,040 mG at 20 Hz. The MPE levels decrease to 2,290 mG at 3 kHz.

For EMF, an Affected Area of 1,000 feet from the project alignment was reviewed for land uses that could have highly EMI-sensitive medical or scientific equipment. At 1,000 feet, EMI would be below sensitivity levels for highly sensitive equipment. Health centers were contacted to determine if they have magnetic resonance imaging (MRI) equipment.

4.13.2 Affected Environment/Existing Conditions

The Earth's background magnetic field varies around an average of about 500 mG (National Institute of Environmental Health Sciences 2002). Examples of magnetic field intensities from human activities include the following (Federal Railroad Administration 2006):

- Overhead power transmission line: 10 to 100 mG directly under transmission lines and less than 10 mG under lateral lines
- Household appliances: 8 to 165 mG (at a distance of 1 foot)
- Rail vehicle (electrically powered): 400 mG (at 43 inches from the vehicle floor) to 1,500 mG (at the vehicle floor level)

Natural and human-generated EMF encompass a broad frequency spectrum. In the United States, the electric power system operates at 60 Hz, or cycles per second, meaning that the field reverses its direction 60 times per second. Radio and other communications operate at much higher frequencies; many are in the range of 500,000 to 3 billion Hz.

High-voltage transmission lines currently cross the corridor in downtown LA near 6th Street (345 kV); alongside the proposed alignment in Huntington Park on Randolph Street (345 kV at approximately 50 feet away) with three direct crossings (345 kV) and Salt Lake Avenue (345 kV at approximately 75 feet away) with three direct crossings (345 kV); crossing the corridor in South Gate near Rayo Avenue (345 kV), the LA River (345 kV), and the Rio Hondo (345 kV); alongside the alignment in Paramount between Arthur Avenue and Somerset Boulevard (345 kV at approximately 125 feet away) (345 kV) and crossing the corridor at Downey Avenue (345 kV); crossing the corridor in Bellflower at Woodruff Avenue (345 kV); and crossing the corridor in Cerritos near the San Gabriel River (345 kV) and Studebaker Road (345 kV). Twenty-two educational, technology, and medical facilities were identified within the Affected Area for EMF. None of the facilities use highly EMI-sensitive equipment.

4.13.3 Environmental Consequences/Environmental Impacts

4.13.3.1 No Build Alternative

There would be no project-created EMF for the No Build Alternative. Current natural and human-generated EMF in the corridor would continue. Other projects with substantial transmission or demand for electricity could generate EMF, which would be reviewed through their own environmental processes and mitigation would be identified as needed.

4.13.3.2 Build Alternatives

The dominant source of EMF for LRT is the DC electric traction system that powers the trains. The DC voltage on the overhead supply wires (i.e., contact wire and messenger) produces a static electric field between the supply wires and ground, and the flow of currents—as trains draw power via pantographs—produces transient magnetic fields as the train travels along the alignment. EMF levels near rail transit decrease rapidly from approximately 100 mG at 30 feet from the tracks to less than 1 mG at 300 feet. There are no conclusive findings regarding the health effects of low-level EMF typical of electrically powered rail vehicles. For all Build Alternatives, magnetic fields from the planned DC traction system for the Project would be short-duration disturbances and low-frequency (< 60 Hz). EMF levels produced by LRT vehicles would be below the C95.6 MPE across the range of frequencies.

Highly sensitive equipment in research, manufacturing, or medical facilities could be affected by EMF levels as low as 0.5 mG. Medical, higher education, research, and industrial land uses within the 1,000-foot Affected Area for EMF were reviewed to assess whether they have research electron microscopes or medical MRI equipment. Neither the Bellflower Health Center nor Angeles Community Health has such equipment. All other facilities were eliminated based on the nature of their operations. Because no facilities with EMF-sensitive equipment were found within 1,000 feet of any Build Alternative, the Project would not affect EMF-sensitive equipment operations.

4.13.3.3 Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station

No highly sensitive equipment was identified in the vicinity of Design Options 1 or 2; therefore, the Design Options would not affect EMF-sensitive equipment operations.

4.13.3.4 Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option

No highly sensitive equipment was identified in the vicinity of the maintenance and storage facility site options; therefore, the maintenance and storage facility would not affect EMF-sensitive equipment operations.

4.13.4 Project Measures and Mitigation Measures

No project measures or mitigation measures for EMF effects would be required.

4.13.5 California Environmental Quality Act Determination

With regard to health impacts and in accordance with CEQA Guideline Section 15145, the known information regarding EMF and health impacts has been summarized without reaching a conclusion of significance. A statement or conclusion of CEQA significance for EMF health impacts would be speculative. With regard to sensitive equipment, there are no universal thresholds. Because no facilities with EMF-sensitive equipment were found within 1,000 feet of the Project, the Project would not affect EMF-sensitive equipment operations.

4.14 Historic, Archaeological, and Paleontological Resources

This section presents a summary of the Section 106 analyses for built environment and archaeological historic properties, the NEPA analysis for paleontological resources, and the CEQA analyses for the historic built environment, archaeological historical resources, and paleontological resources that were performed for the Project. Section 106, NEPA, and CEQA analyses for these disciplines may be found in the following reports:

- *West Santa Ana Branch Transit Corridor Project Final Cultural Resources Survey Report–Rev 1* (Metro 2020d) (Appendix W)
- *West Santa Ana Branch Transit Corridor Project Revised Preliminary Cultural Resources Effects Report* (Metro 2021u) (Appendix X)
- *West Santa Ana Branch Transit Corridor Project Final Paleontological Resources Impacts Analysis Report* (Metro 2021y) (Appendix Y)

Tribal Cultural Resources are addressed independently in Section 4.15 of this Draft EIS/EIR.

4.14.1 Regulatory Setting and Methodology

This section summarizes the regulatory context that governs built, archaeological, and paleontological resources. The regulations included directly relate to the analysis presented in this section. For a full summary of all applicable regulations, please see the above cited reports.

4.14.1.1 Regulatory Setting

Historic and Archaeological Resources

Federal

Built environment and archaeological historic properties are considered during federal undertakings chiefly under Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) through one of its implementing regulations, 36 CFR 800 (Protection of Historic Properties).

National Historic Preservation Act

The NHPA (as amended) (54 U.S.C. § 300101 through § 320303) is the cornerstone of the federal cultural resources preservation program, as it sets forth the policy and procedures regarding built environment and archaeological historic properties. It requires federal agencies to consider the effects of their undertakings, such as construction projects, on historic properties and properties that an Indian Tribe regards as having religious and/or cultural importance (i.e., Traditional Cultural Properties). Direct effects to historic properties are defined as those that come from an undertaking at the same time and place with no intervening cause. Indirect effects to historic properties are those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable (Advisory Council on Historic Preservation 2019).

Historic properties are defined as any prehistoric or historic districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places (NRHP). To be eligible for inclusion in the NRHP, properties must be significant in American (including federal, state, and/or local) history, architecture, archaeology, engineering, or culture, and generally must be at least 50 years old. Historic properties must also possess integrity of location, design, setting, materials, workmanship, feeling, or association, and meet at least one of the following criteria (36 CFR Part 60.4):

A) Are associated with events that have made a significant contribution to the broad patterns of our history
B) Are associated with the lives of persons significant in our past
C) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
D) Have yielded, or may be likely to yield, information important in prehistory or history

Section 106 of the NHPA (54 U.S.C. § 306108) requires federal agencies to afford the Advisory Council on Historic Preservation, acting through the State Historic Preservation Office (SHPO) or the Tribal Historic Preservation Office, a reasonable opportunity to comment on the effects of an undertaking. It does so through consultation, the goal of which is to identify historic properties potentially affected by the undertaking, assess the

undertaking's effects on the historic properties, and seek ways to avoid or minimize, or mitigate adverse effects on historic properties.

State

The protection of historical resources, including built environment and archaeological, in California is primarily addressed through the regulatory measures of CEQA, presented below.

California Environmental Quality Act

CEQA (PRC § 21000 et seq.), requires evaluation of proposed projects that may cause significant effects on historical resources. Under CEQA, "historical resources" must be identified; expected impacts must be analyzed; and mitigation must be identified and implemented, where necessary.

The CEQA Guidelines define a "historical resource" as:

1. A resource listed in or determined to be eligible by the State Historical Resources Commission for listing in the California Register of Historical Resources (CRHR) (PRC Section 5024.1, Title 14 CCR, § 4850 et seq.).
2. A resource included in a local register of historical resources, as defined in section 5020.1(k) of the PRC or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, shall be presumed to be historically or culturally significant.
3. Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. (*CEQA Guidelines*, § 15064.5(a).)

CEQA equates a "substantial adverse change" in the historic significance of a resource with a significant effect on the environment (PRC Section 21084.1). A "substantial adverse change" in the significance of a historical resource is defined by the *CEQA Guidelines* as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired" (*CEQA Guidelines*, § 15064.5(b)). The significance of a historical resource is materially impaired when the project demolishes or materially alters the physical characteristics of the resource that qualifies the resource as historic. If the project's effects on historic properties meet any CEQA impact conditions, mitigation measures are recommended for avoidance, to minimize impacts, or to provide balanced compensation for adverse effects. Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings shall be considered mitigated to a less than significant impact on the historical resource (*CEQA Guidelines*, § 15064.5(b)(3)).

The CRHR was established under California PRC Section 5024.1 to serve as an authoritative guide to the state's significant historic and archaeological resources. A resource is considered historically significant if it meets the criteria for listing in the CRHR (PRC Section 5024.1, Title 14 CCR, § 4852). For a property to be considered eligible for listing in the CRHR, it

must be found to be significant under at least one of the following four criteria by the State Historical Resources Commission:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage
2. Is associated with the lives of persons important in our past
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values
4. Has yielded, or may be likely to yield, information important in prehistory or history

In addition to possessing one of the above characteristics, to be eligible for listing in the CRHR resources must retain "substantial" integrity to their period of significance. The seven aspects or qualities of integrity are the same as those applied to NRHP-eligible properties: location, design, setting, materials, workmanship, feeling, and association.

The CRHR also includes properties that:

- Have been determined eligible for listing in, or are listed in, the NRHP
- Are registered State Historical Landmark No. 770 and all consecutively numbered landmarks above Number 770
- Are points of historical interest that have been reviewed and recommended to the State Historical Resources Commission for listing
- Are City- and County-designated landmarks or districts

Historic districts are a concentration of historic buildings, structures, objects, or sites within precise boundaries that share a common historical, cultural, or architectural background. Individual resources in a historic district may lack individual significance but be considered a contributor to the significance of the historic district.

Local

For the purposes of CEQA, resources eligible for or listed in the CRHR are, by definition, "historical resources." Resources included in a local register of historical resources or deemed significant and also designated at the local level (i.e., given a California Historical Resources Status Code 3 through 5 in a survey meeting the California Office of Historic Preservation requirement), are presumed to be historically or culturally significant for purposes of CEQA. The Project traverses several municipalities that maintain local registers of historical resources and the analysis presented here within considered effects/impacts to locally eligible resources. For a description of each of the registers and their eligibility criteria, refer to the Cultural Resources Effects Report.

Paleontological Resources

Federal

Federal protection for scientifically significant paleontological resources applies to projects if any construction or other related project impacts occur on federally owned or managed lands, involve the crossing of state lines, or are federally funded. The federal protections described below may apply to paleontological resources in the Affected Area.

NEPA of 1969, as amended (Public Law [P.L.] 91-190, 42 U.S.C. 4321- 4347, January 1, 1970, as amended by P.L. 94-52, July 3, 1975; P.L. 94-83, August 9, 1975; and P.L. 97-258 Section 4(b), September 13, 1982), recognizes the continuing responsibility of the federal government to "preserve important historic, cultural, and natural aspects of our national heritage" (Section 101 [42 U.S.C. Section 4321], No. 382).

The Paleontological Resources Preservation Act, enacted as a result of the passage of the Omnibus Public Lands Management Act of 2009, P.L. 111-011, Title VI, Subtitle D, Paleontological Resources Preservation sets forth regulations and provisions pertaining to paleontological resources on all federally administered lands.

State

The protection of paleontological resources in California is addressed through the regulatory compliance of CEQA.

California Environmental Quality Act

Paleontological resources are considered nonrenewable scientific resources and are protected under CEQA, which states, in part, that a project will "normally" have a significant effect on the environment if it, among other things, will disrupt or adversely affect a paleontological site except as part of a scientific study. Specifically, in Appendix G of the *CEQA Guidelines*, the "Environmental Checklist Form," the question is posed: "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature." In order to determine the uniqueness of a given paleontological resource, it must first be identified or recovered (i.e., salvaged). Therefore, mitigation of potentially adverse impacts to paleontological resources is mandated by CEQA.

Local

The Cities of Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, and Bellflower do not have any ordinances or policies relating to paleontological resources. The Los Angeles County 2035 General Plan and the Conservation Element of the City of Los Angeles General Plan (2011b) both include policies aimed at the protection of paleontological resources. Further explanation of these policies is included in the Paleontological Resources Impacts Analysis Report.

4.14.1.2 Methodology

Historic and Archaeological Resources

Area of Potential Effects

The Area of Potential Effects (APE) was established through consultation among the lead federal agency, which is the FTA; the lead CEQA agency, which is Metro; and SHPO in accordance with 36 CFR 800.16(d), which defines an APE as:

> The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

The APE has been delineated to encompass areas that may be directly or indirectly affected by the Project, including temporary and permanent effects and potential visual, noise, vibration, and/or ground settlement effects that may result from construction or implementation of the Project.

The direct or archaeological APE encompasses the alignment ROWs, as well as all associated elements where construction would occur, including stations, laydown yards, maintenance facilities, and parking lots. In the underground portion of the Project, the direct APE encompasses the street or parcels directly above the tunnel areas, as well as any other areas with related ground disturbance. For the at-grade portion of the Project, the direct APE includes the width of the existing railroad ROW. For the aerial portion of the Project, the direct APE encompasses the width of the proposed ROW. The direct APE additionally includes areas with potential direct ground disturbance, accounting for temporary (construction) and permanent project elements, including but not limited to, the following: whole or partial parcel acquisitions, train control, TPSS sites, ventilation structures, and MSF options. The extent of the direct APE is defined by the direct temporary and permanent disturbance associated with construction and operation of the typical project elements listed above. The vertical extent of the APE varies with the depth of ground disturbance and tunneling and areas where the alignment may be aerial. It roughly extends approximately 115 feet below the existing ground surface and approximately 90 feet above the existing ground surface.

The architectural APE includes all areas that may be subject to potential direct and indirect effects, including visual, noise, vibration, and/or ground settlement that may result from construction or implementation of the Project. It is broadly defined as the direct APE and a one parcel buffer out from the direct APE in all areas where the Project is underground or aerial. In areas where the proposed alignment would be at-grade, within existing railroad or Metro ROWs, the architectural APE encompasses the same area as the direct APE. This is because the introduction of a rail system in areas where rail systems functioned historically would not have an increased potential to cause indirect effects to historic properties. In areas where the proposed alignment is underground, aerial, or outside existing railroad ROW, the architectural APE extends horizontally to the first row of adjacent parcels and vertically as described above. The direct and the architectural APE are identified in blue and red, respectively, in Figure 4.14-1.

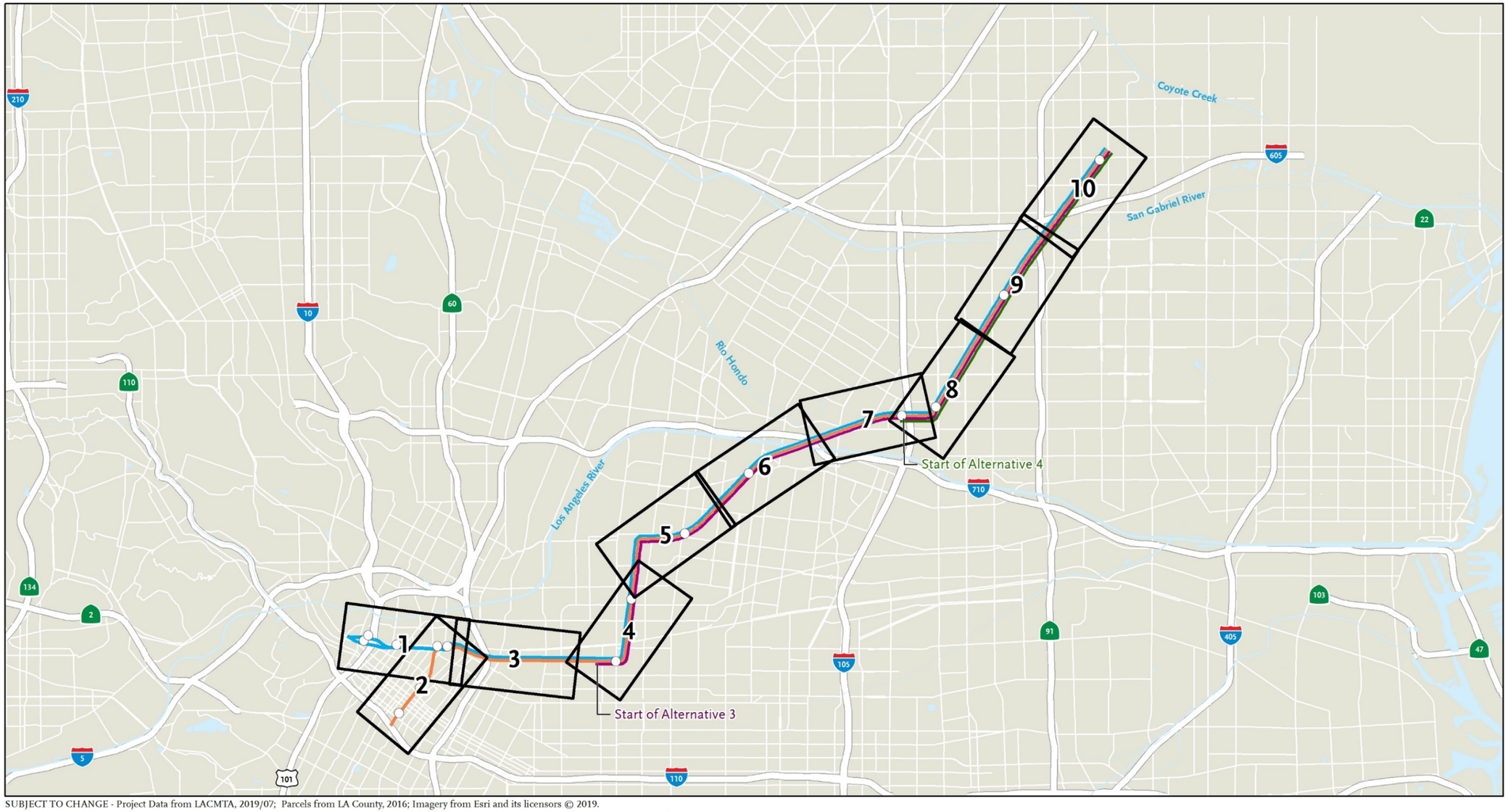
Effects/Impacts Criteria

Federal Criteria

The analysis of potential effects on historic and archaeological resources is based on the Criteria of Adverse Effects, defined in 36 CFR 800 as: "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" (36 CFR 800.16[i]). The criteria of adverse effect are included below for reference.

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. (36 CFR 800.5[a][1]).

Figure 4.14-1. Direct and Architectural APE and Built Environment Results



SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Parcels from LA County, 2016; Imagery from Esri and its licensors © 2019.

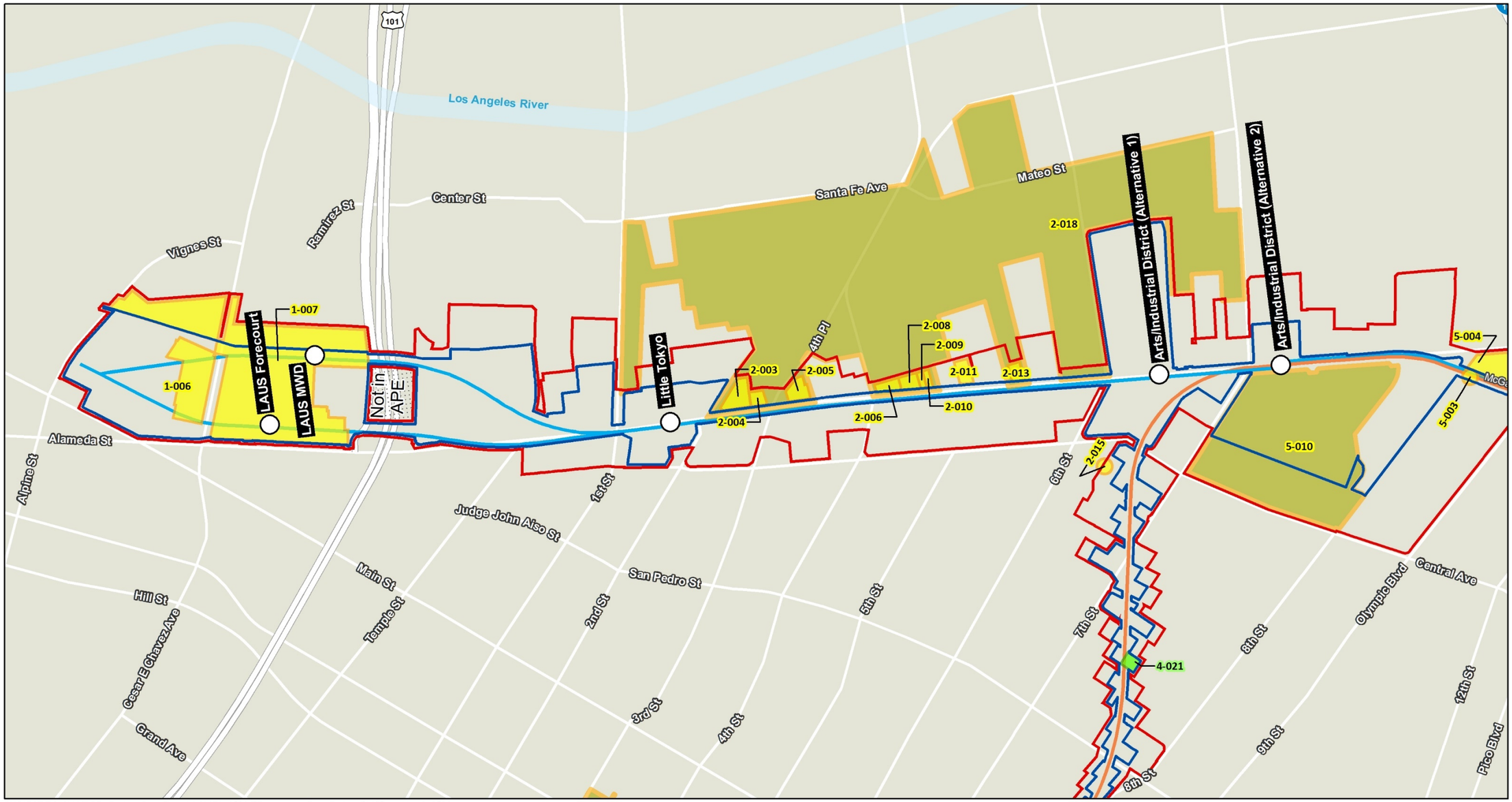
Sheet Index

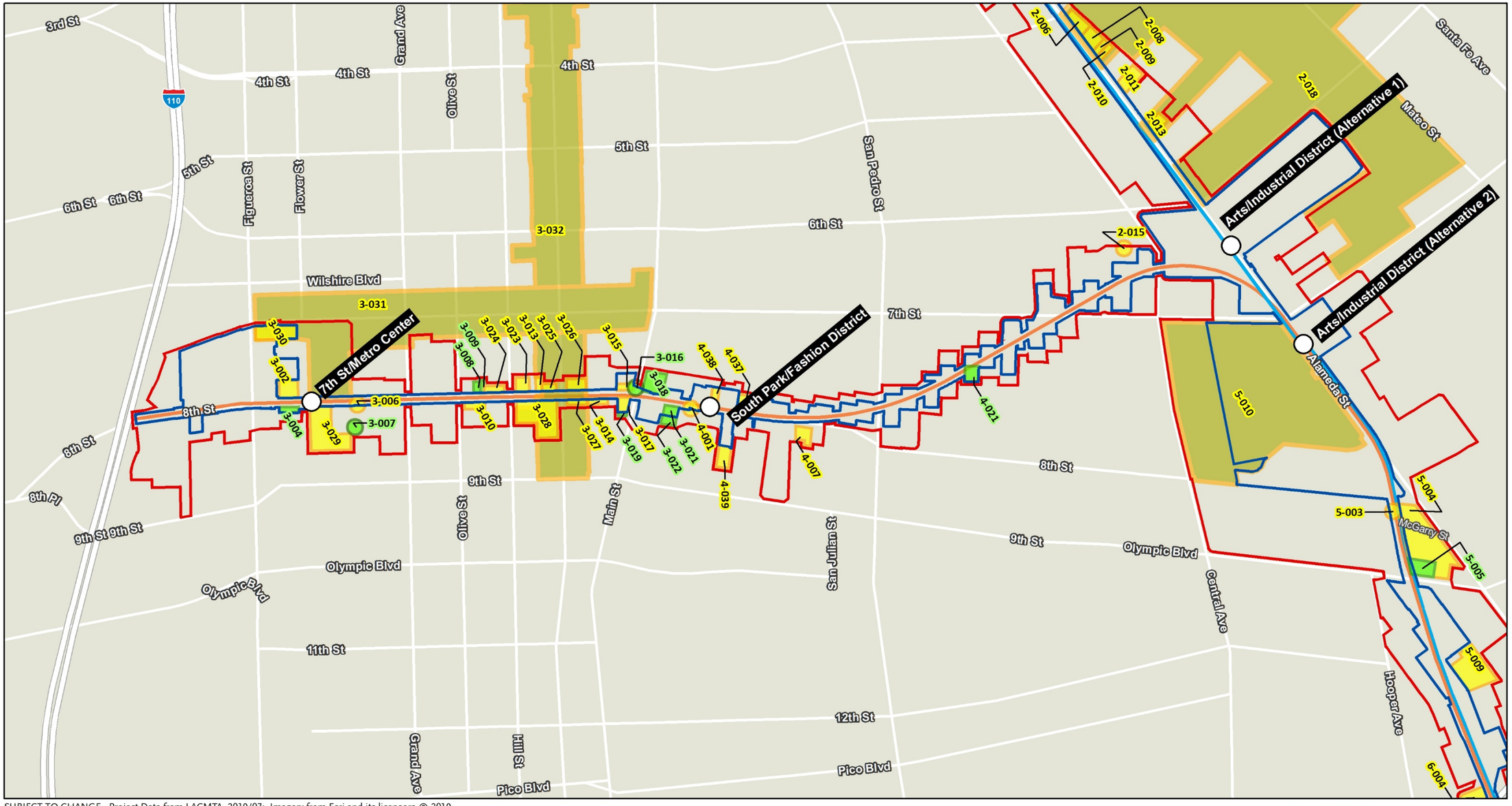
West Santa Ana Branch (WSAB) Proposed

- Stations
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Alternative 3: Slauson/A Line (Blue) to Pioneer
- Alternative 4: I-105/C Line (Green) to Pioneer

N

0 0.5 1 1.5 Miles


Los Angeles River
101
Vignes St
Ramirez St
Center St
Santa Fe Ave
Mateo St
2-018
Arts/Industrial District (Alternative 1)
Arts/Industrial District (Alternative 2)
1-007
LAUS Forecourt
LAUS MWD
1-006
Not in APE
Little Tokyo
4th Pl
2-003
2-005
2-008
2-009
2-011
2-013
2-004
2-006
2-010
5-004
5-003
5-010
2-015
Alameda St
Alpine St
1st St
6th St
Judge John Aiso St
Main St
San Pedro St
Hill St
Temple St
2nd St
5th St
7th St
Olympic Blvd
Central Ave
Cesar E Chavez Ave
Grand Ave
3rd St
4th St
8th St
9th St
12th St
Pico Blvd
4-021
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.
Direct APE
Architectural APE
Station
Alternative 1: Union Station to Pioneer
Alternative 2: 7th St/Metro Center to Pioneer
Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
Properties Listed or Eligible for State and/or Local Listing (Historical Resources)
Historic District Listed, Determined or Assumed Eligible for Listing in the NRHP
N
0
400
800
Feet
Sheet 1 of 10



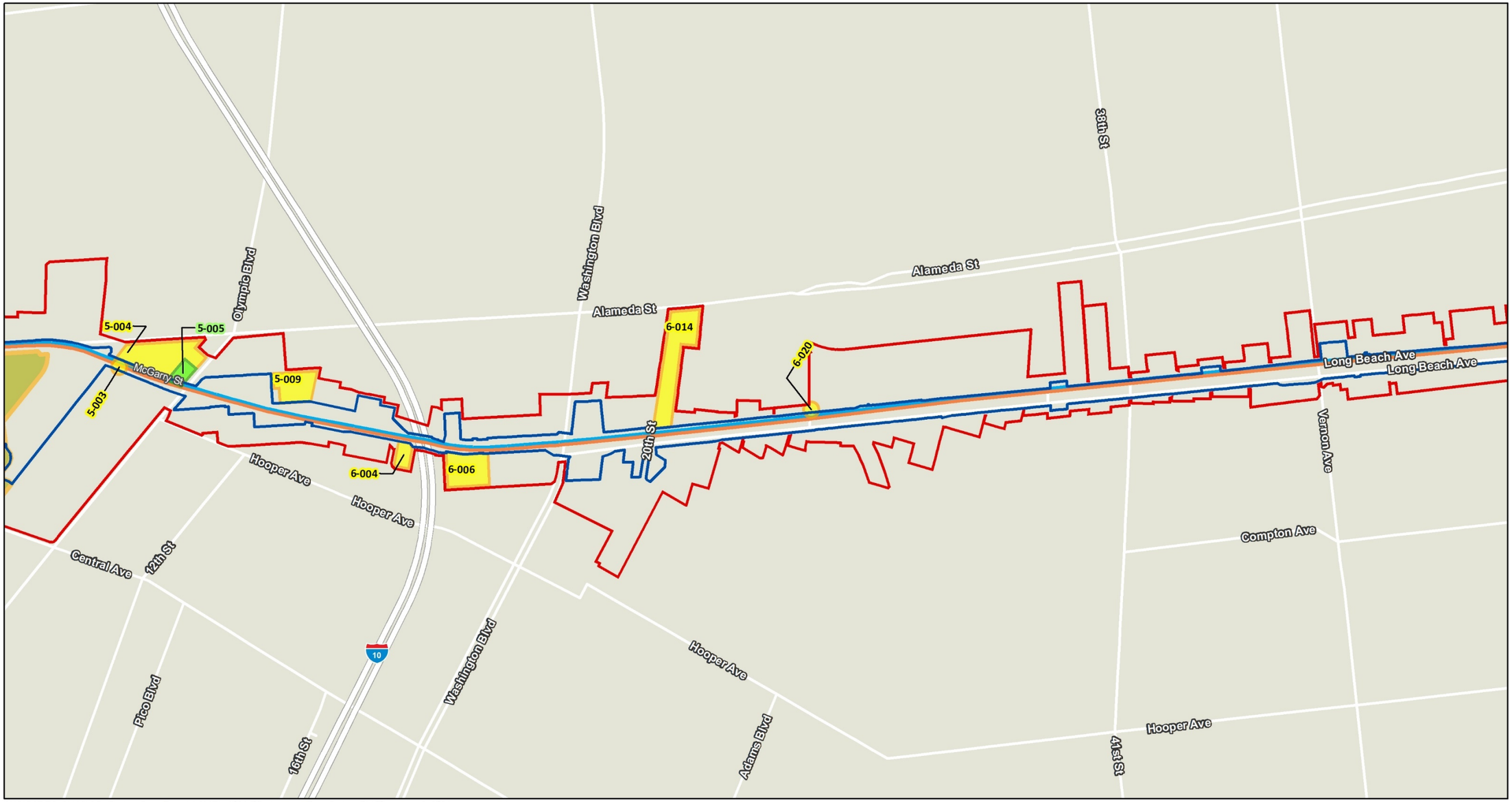
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.

- Direct APE
- Architectural APE
- Station
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
- Properties Listed or Eligible for State and/or Local Listing (Historical Resources)
- Historic District Listed, Determined or Assumed Eligible for Listing in the NRHP

N

0 400 800 Feet

Sheet 2 of 10

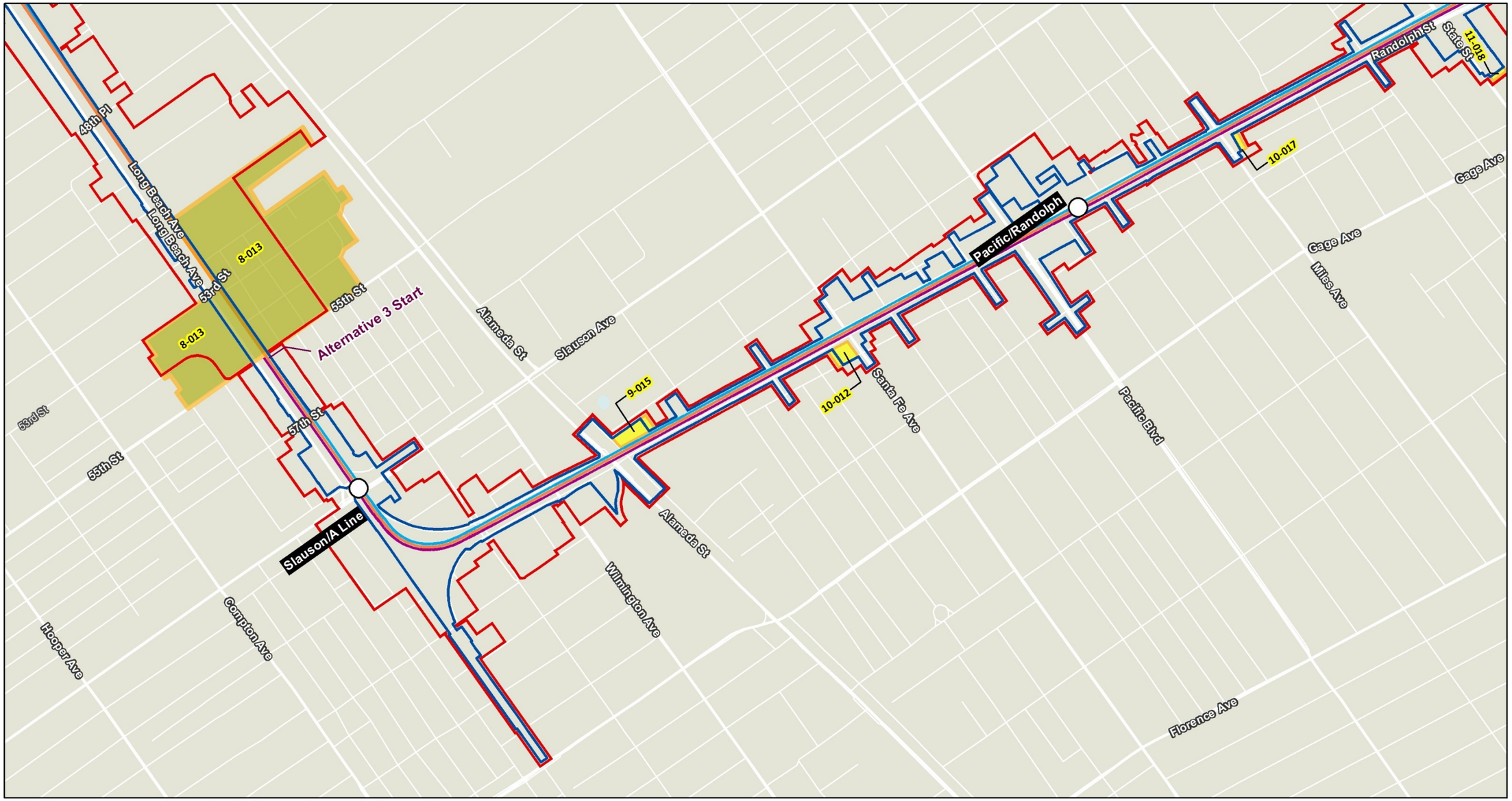


SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.

- Direct APE
- Architectural APE
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
- Properties Listed or Eligible for State and/or Local Listing (Historical Resources)
- Historic District Listed, Determined or Assumed Eligible for Listing in the NRHP

0 400 800 Feet

Sheet 3 of 10



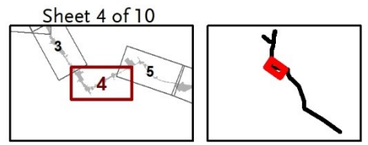
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.

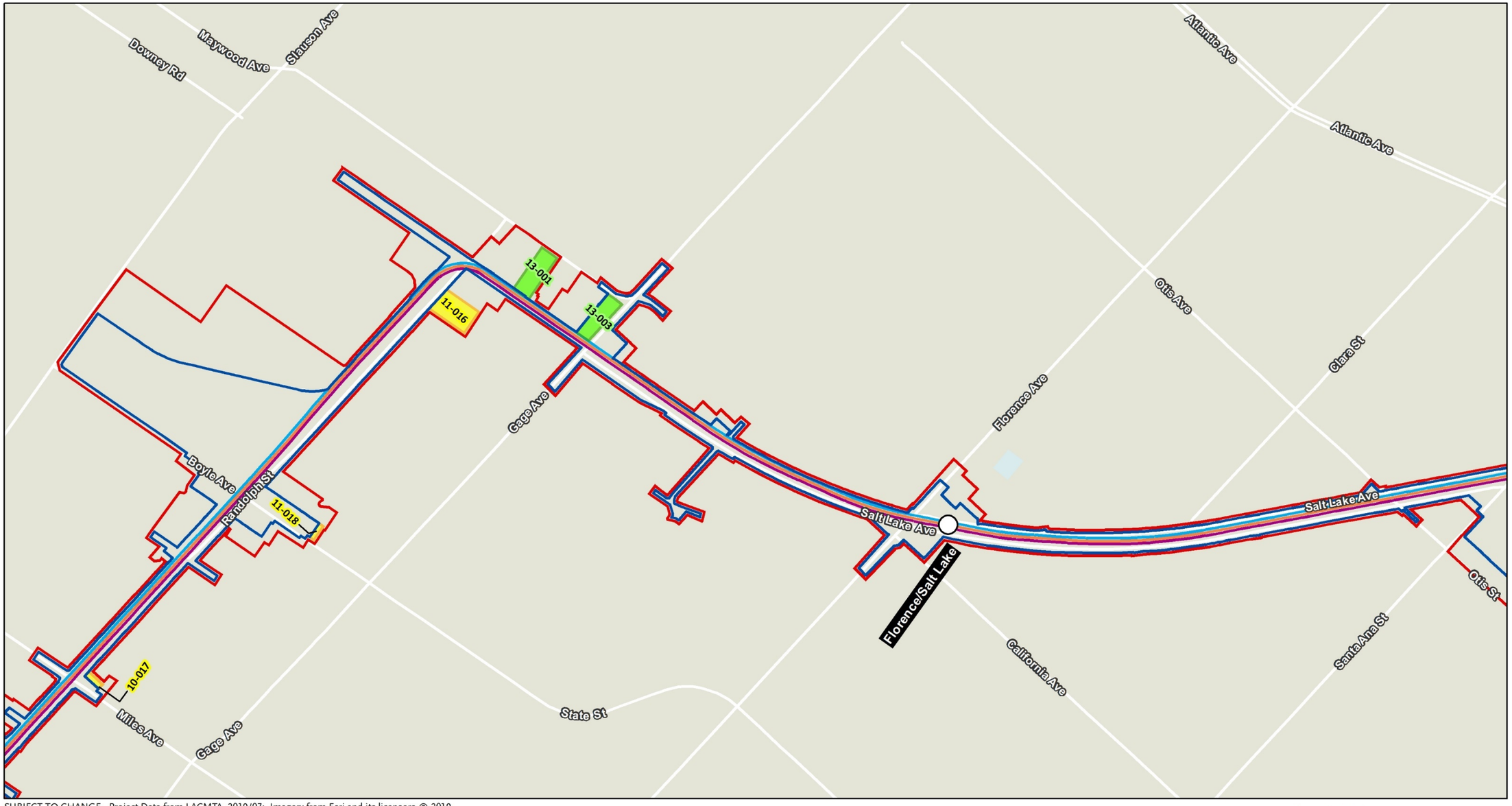
- Direct APE
- Architectural APE
- Station
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Alternative 3: Slauson/A Line (Blue) to Pioneer
- Properties Listed and/or Eligible for Listing in the NRHP
- Historic District Listed, Determined, Eligible or Assumed Eligible for Listing in the NRHP

N

0 400 800 Feet

Sheet 4 of 10



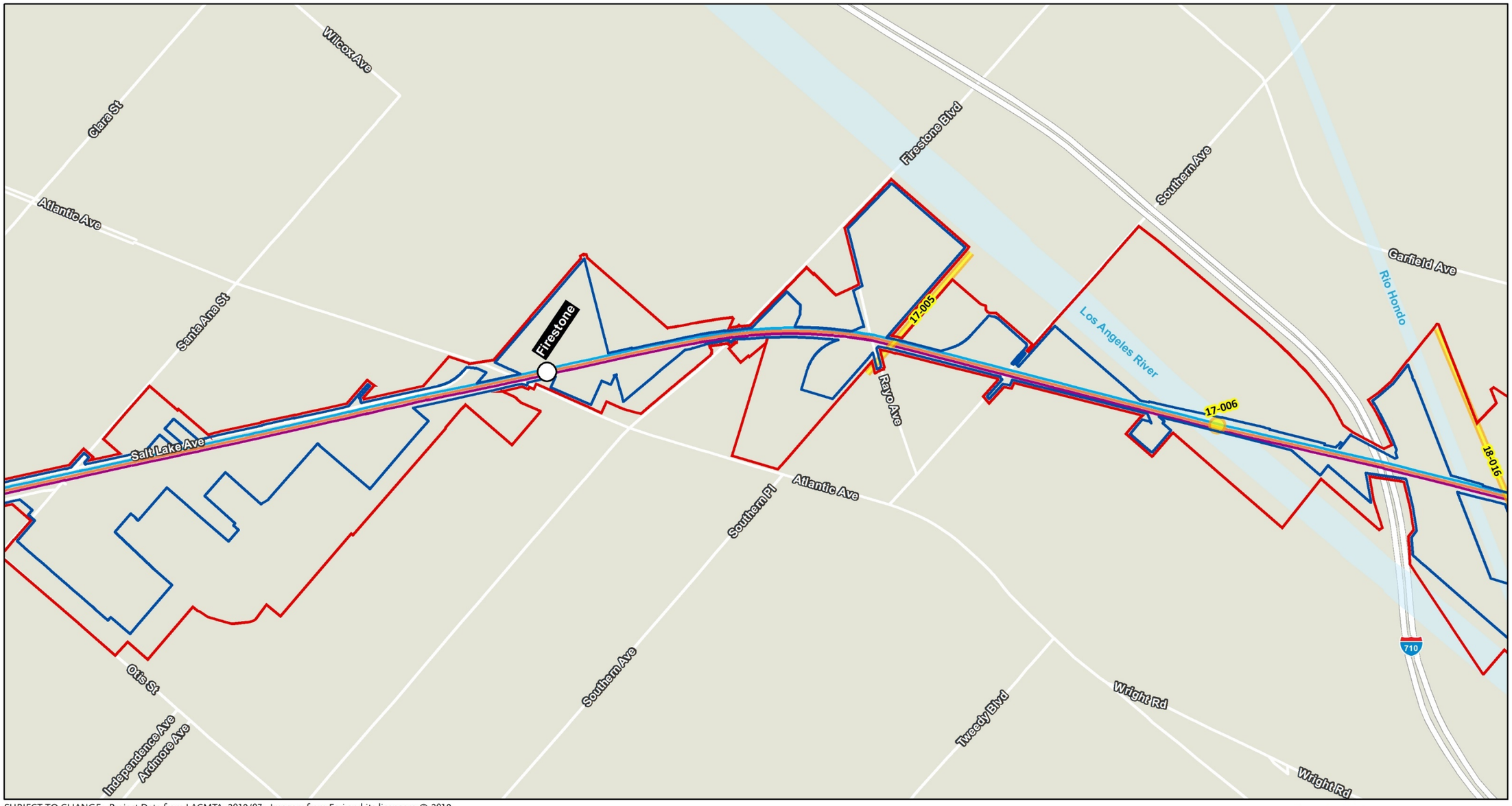


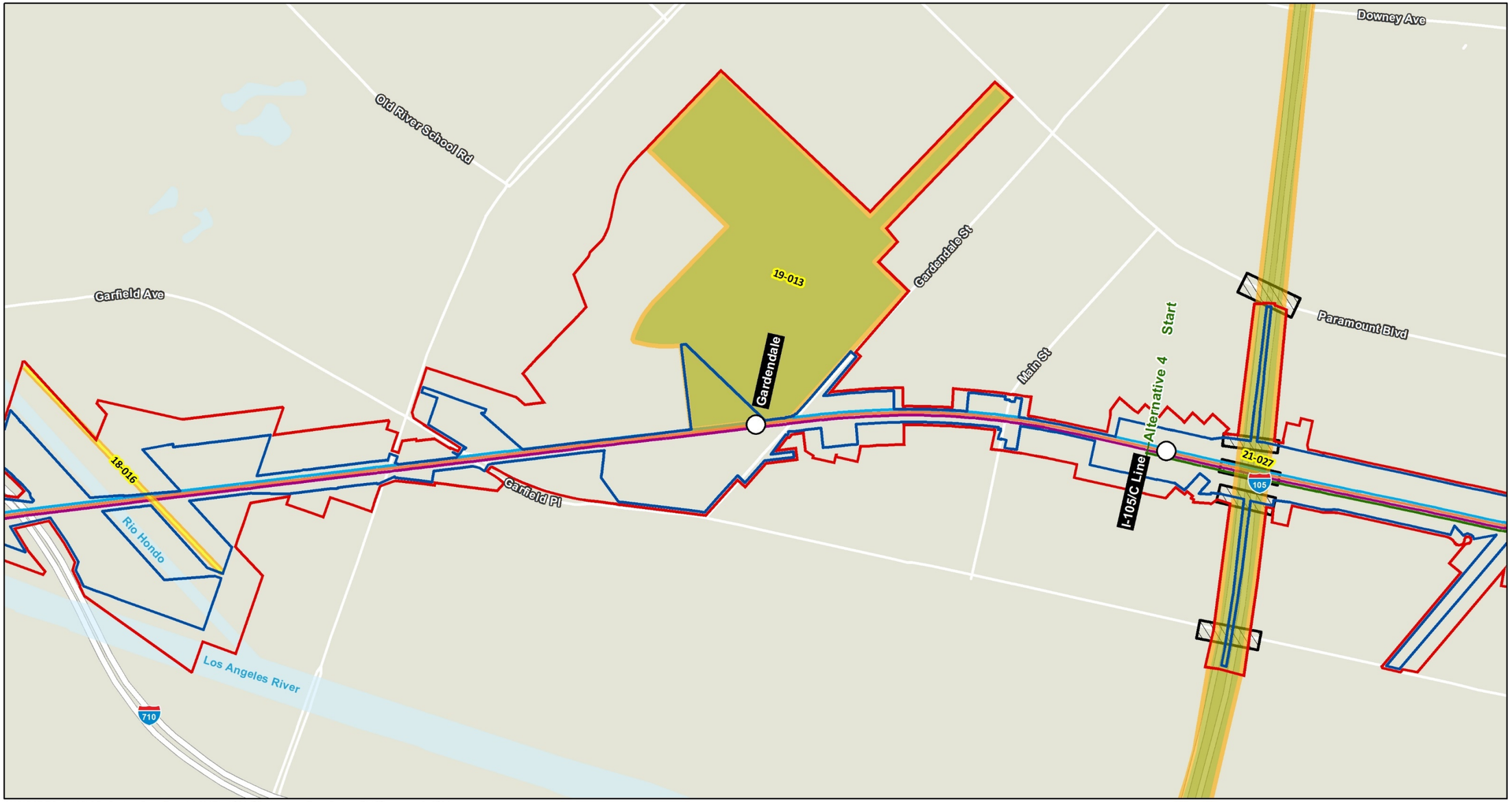
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.

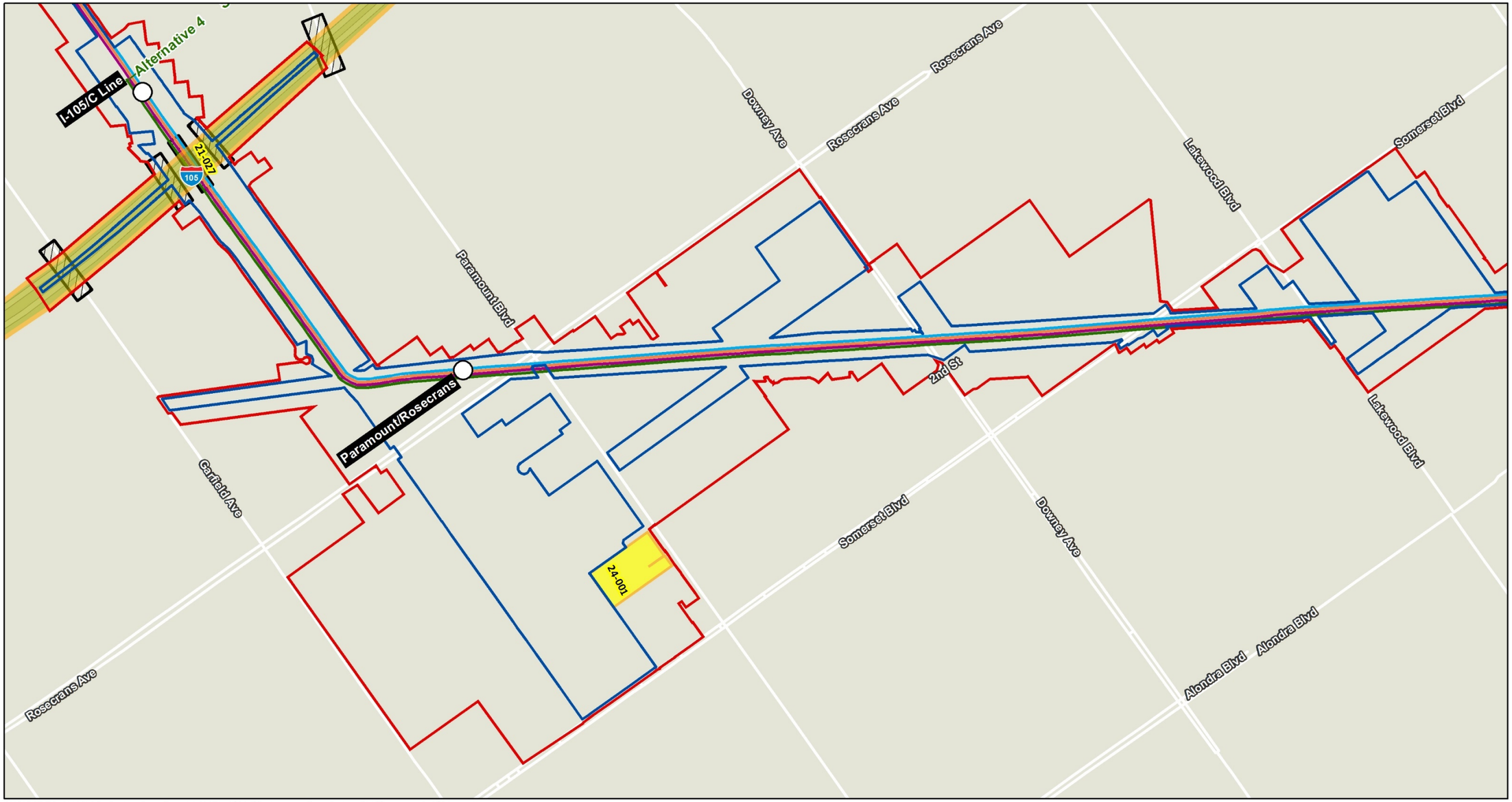
- Direct APE
- Architectural APE
- Station
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Alternative 3: Slauson/A Line (Blue) to Pioneer
- Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
- Properties Listed or Eligible for State and/or Local Listing (Historical Resources)

0 400 800 Feet

Sheet 5 of 10


Wilcox Ave
Clara St
Atlantic Ave
Santa Ana St
Firestone
Salt Lake Ave
Firestone Blvd
Rayo Ave
17-005
Southern Ave
Los Angeles River
Garfield Ave
Rio Hondo
17-006
18-016
Atlantic Ave
Southern Pl
Southern Ave
Otis St
Independence Ave
Ardmore Ave
Tweedy Blvd
Wright Rd
Wright Rd
710
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.
Direct APE
Architectural APE
Station
Alternative 1: Union Station to Pioneer
Alternative 2: 7th St/Metro Center to Pioneer
Alternative 3: Slauson/A Line (Blue) to Pioneer
Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
0 400 800
Feet
Sheet 6 of 10
5
6
7


Old River School Rd
Garfield Ave
Downey Ave
Paramount Blvd
Gardendale St
Main St
Garfield Pl
19-013
Gardendale
Alternative 4 Start
I-105/C Line
21-027
105
18-016
Rio Hondo
Los Angeles River
710
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.
Direct APE
Architectural APE
Station
Alternative 1: Union Station to Pioneer
Alternative 2: 7th St/Metro Center to Pioneer
Alternative 3: Slauson/A Line (Blue) to Pioneer
Alternative 4: I-105/C Line (Green) to Pioneer
Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
Historic District Listed, Determined or Assumed Eligible for Listing in the NRHP
Contributing Bridges to the Century Freeway-Transitway Historic District
N
0 400 800
Feet
Sheet 7 of 10
6
7
8
9
1



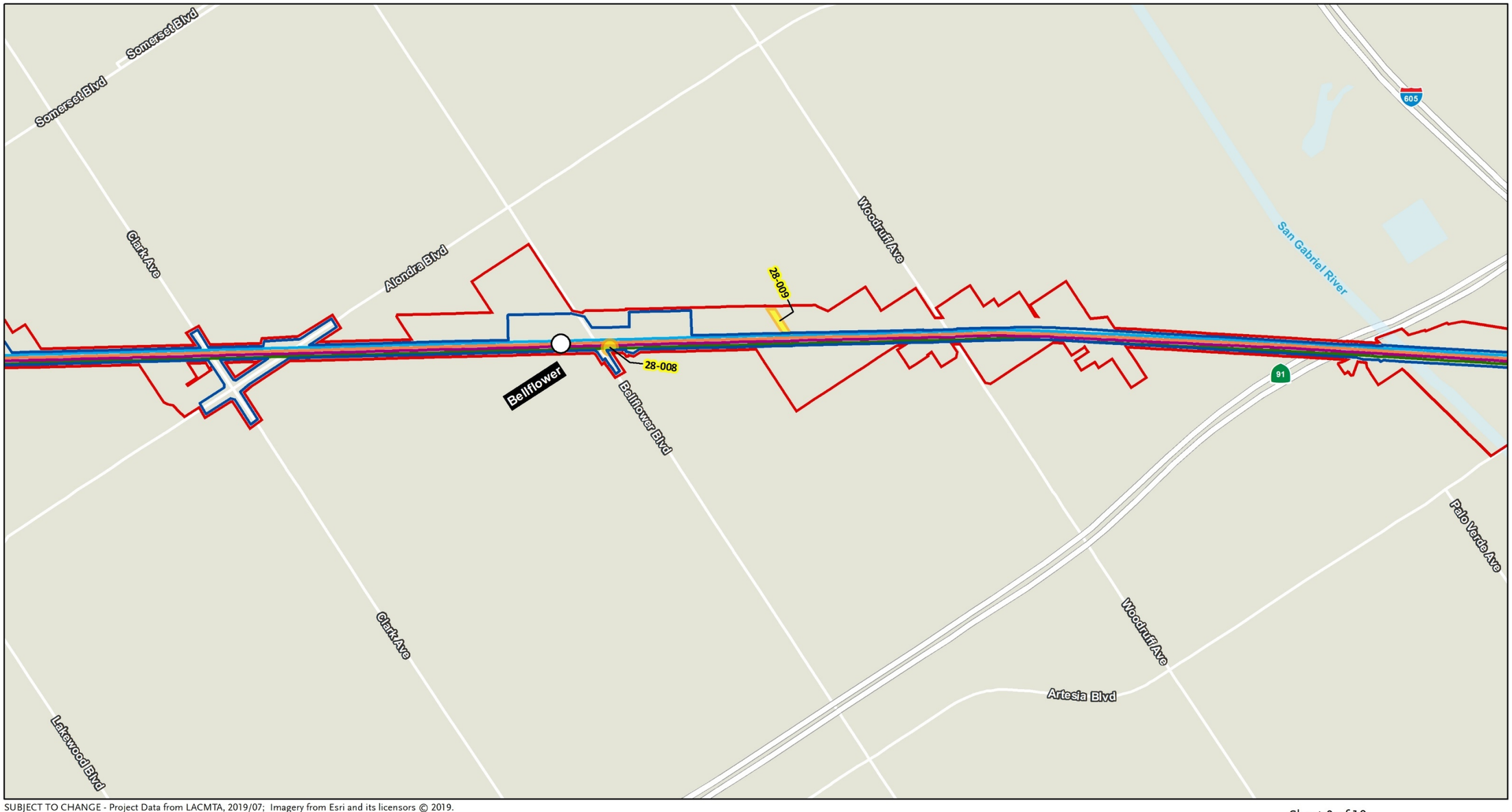
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.

- Direct APE
- Architectural APE
- Station
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Alternative 3: Slauson/A Line (Blue) to Pioneer
- Alternative 4: I-105/C Line (Green) to Pioneer
- Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)
- Historic District Listed, Determined or Assumed Eligible for Listing in the NRHP
- Contributing Bridges to the Century Freeway-Transitway Historic District

N

0 400 800 Feet

Sheet 8 of 10



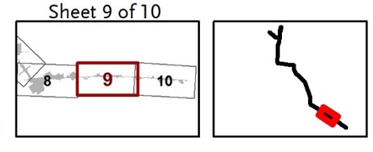
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.

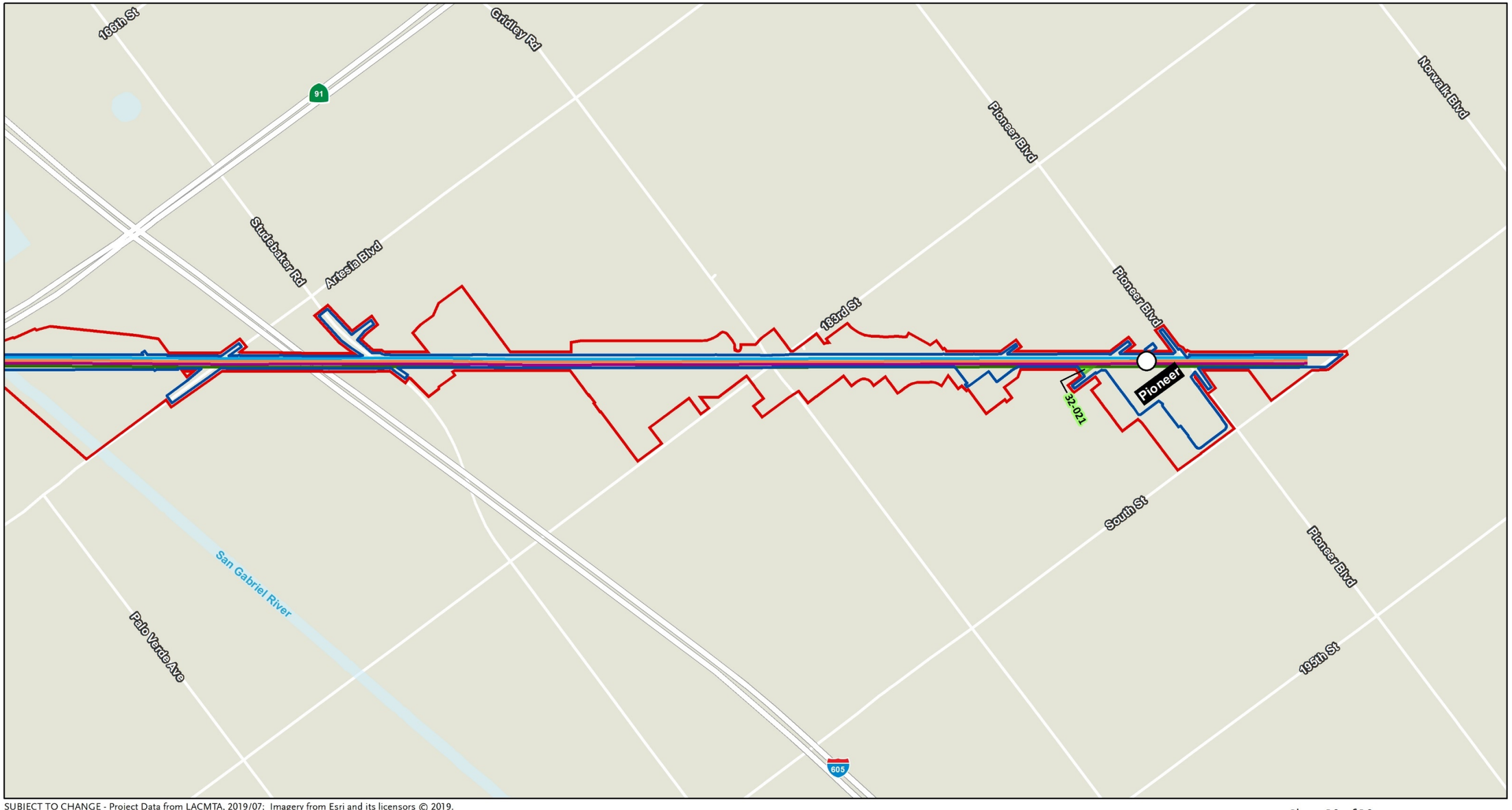
- Direct APE
- Architectural APE
- Station
- Alternative 1: Union Station to Pioneer
- Alternative 2: 7th St/Metro Center to Pioneer
- Alternative 3: Slauson/A Line (Blue) to Pioneer
- Alternative 4: I-105/C Line (Green) to Pioneer
- Properties Listed, Determined or Assumed Eligible for Listing in the NRHP (Historic Properties)

N

0 400 800 Feet

Sheet 9 of 10




166th St
Gridley Rd
91
Norwalk Blvd
Pioneer Blvd
Studebaker Rd
Artesia Blvd
133rd St
Pioneer Blvd
Pioneer
32-021
South St
Pioneer Blvd
San Gabriel River
Palo Verde Ave
195th St
605
SUBJECT TO CHANGE - Project Data from LACMTA, 2019/07; Imagery from Esri and its licensors © 2019.
Direct APE
Architectural APE
Station
Alternative 1: Union Station to Pioneer
Alternative 2: 7th St/Metro Center to Pioneer
Alternative 3: Slauson/A Line (Blue) to Pioneer
Alternative 4: I-105/C Line (Green) to Pioneer
Properties Listed or Eligible for State and/or Local Listing (Historical Resources)
N
0
400
800
Feet
Sheet 10 of 10
9
10

According to 36 CFR 800.5[a][2], examples of an adverse effect on historic properties include, but are not limited to, the following:

(i) Physical destruction of or damage to all or part of the property;
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;
(iii) Removal of the property from its historic location;
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

When the effects of the proposed undertaking do not meet the criteria of adverse effect, then a finding of no adverse effect may be proposed (36 CFR 800.5[b]). If an adverse effect is found, the agency shall act pursuant to 36 CFR 800.6 (36 CFR 800.5[d][2]) to resolve the adverse effect by developing and evaluating alternatives or modifications to the undertaking that "could avoid, minimize or mitigate adverse effects on historic properties" (36 CFR 800.6[a]).

State Criteria

The analysis of potential impacts on historic and archaeological resources is based on *CEQA Guidelines* Appendix G Criteria. According to these criteria, adverse impacts to cultural resources would be considered significant if the proposed project would:

- Cause a substantial adverse change in the significance of a historical resource as defined in CCR Section 15064.5 (defined as listed or determined eligible for a state or local register, or any building, structure, or object that is determined to be historically significant to California history)
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CCR Section 15064.5 or a unique archaeological resource as defined in PRC 21083.2[g]
- Disturb any human remains, including those interred outside of formal cemeteries

Section 15064.5 of the *CEQA Guidelines* provides that, in general, a resource not listed on state or local registers of historical resources shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the CRHR. This section also provides standards for determining what constitutes a "substantial adverse change" that must be considered a significant impact on archaeological or historical resources. For example, a "substantial adverse change" in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired" (*CEQA Guidelines*, 14 CCR §15064.5 [b][1]).

Types of Effects/Impacts

As stated above, Section 106 defines an effect, including both direct and indirect, as an "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register [of Historic Places]." In assessing effects, Section 106 states that an adverse effect occurs when "…an undertaking may alter, directly or indirectly, any of the characteristics of a historic property…" Similarly, CEQA defines a significant impact to a historical resource as one that may cause a substantial adverse change in the significance of a historical resource (§ 21084.1). CEQA defines a substantial adverse change as the "…physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (15064.5).

This study considered both direct and indirect effects to historic properties/historical resources. Physical impacts to historic properties/historical resources primarily include their alteration or modification. In addition to physical effects/impacts, those such as noise, vibration, and visual effects/impacts were considered, as they too have the capability to adversely affect historic properties and significantly impact historical resources. The thresholds and methods for evaluating noise, vibration, and visual effects/impacts on historic properties/historical resources are further described in the following sections.

Noise Effect/Impacts

FTA has not established noise thresholds to determine the level of noise that would constitute an adverse effect/significant impact to historic properties/historical resources. Further, what constitutes a noise impact under NEPA may or may not be applicable or equivalent to effects on historic properties under Section 106 or significant impacts to historical resources under CEQA. Under Section 106, an adverse noise effect would occur if it were to alter the characteristics of a historic property that make it eligible for inclusion in the NRHP or if it were to diminish a historic property's ability to convey historic significance. Similarly, under CEQA, a significant noise impact would occur if it were to result in the substantial adverse change in the significance of a historical resource.

The potential noise effects/impacts associated with the Project were evaluated and presented in the *West Santa Ana Branch Transit Corridor Project Final Noise and Vibration Impact Analysis Report* (Metro 2021c), included as Appendix M to this Draft EIS/EIR. However, an adverse effect/significant impact as assessed in the Noise and Vibration Impact Report does not necessarily imply an adverse effect/significant impact to a historic property/historical resource for the purposes of Section 106 or CEQA. In the analysis presented in the Revised Preliminary Cultural Resources Effects Report (Appendix X) potential noise effects/impacts to historic properties were considered adverse/significant if they would introduce noise that would alter the character of a historic property's use that contributes to its historic significance or diminish the integrity of its significant historic features. If the significant features or integrity of a historic property would be altered as a result of noise associated with the Project, an adverse effect/significant impact would occur.

Vibration Effects/Impacts

Groundborne vibration generated by construction equipment or project operation has the potential to result in damage to historic properties/historical resources. Physical damage to a historic property/historical resource may alter its characteristics such that it is no longer eligible for inclusion in the NRHP or that its ability to convey its historic significance is

diminished. Physical damage may also constitute the substantial adverse change in the significance of a historical resource if the resource or its surroundings are physically altered. Depending on the nature and extent, physical damage to historic properties/historical resources due to vibration may constitute an adverse effect under Section 106 and a significant impact under CEQA.

Potential vibration effects/impacts of the Project were evaluated and presented in the Noise and Vibration Impact Report (Appendix M). That study applied a damage risk criterion of 0.20 in/sec (PPV) to all historic buildings in the APE. A damage risk criteria of 0.20 PPV is protective of all but the most fragile buildings. The study indicated that there are no historic properties in the APE where 0.20 PPV would be exceeded (Section 5 of the Noise and Vibration Impact Report [Appendix M]) during project construction. Additionally, groundborne vibration levels associated with project operation would be well below architectural or structural damage risk criteria. For the purposes of the analysis presented in the Cultural Resources Effects Report (Appendix X) and summarized in this section, potential vibration effects/impacts that do not have the potential to result in damage to historic properties/historical resources were considered not adverse or significant.

Visual Effects/Impacts

The Project has the potential to result in adverse visual effects/impacts to historic properties/historical resources. Adverse visual effects under Section 106 are those that diminish a historic property's integrity, negatively affecting its ability to convey historic significance and hence compromising its eligibility for historic designation. Similarly, under CEQA, visual changes to a historical resource have the ability to result in substantial adverse change in the significance of that resource. Examples of such potential effects/impacts include the introduction of elements into the setting of a property and the alteration of the viewsheds to and from a historic property/historical resource.

Determining why a property is significant and understanding what characteristics make it so are essential to assessing visual effects/impacts. For the purposes of the analysis presented in this study, the existing relationship of a historic property/historical resource to its current setting and the reason for its significance and character-defining features were first identified. The setting of a historic property/historical resource may or may not contribute to its significance and, therefore, the visibility of the Project from a given historic property/historical resource may or may not result in an adverse effect/significant impact. Visual effects/impacts were analyzed for their ability to diminish a property/resource's integrity of setting, if in fact setting is essential in a given property's ability to convey significance.

Paleontological Resources

Affected Area

The Affected Area for paleontological resources includes the ground surface and subsurface within the proposed alignments, stations, MSF site options, TPSS sites, and parking facilities where ground disturbance associated with the Project may occur. This Affected Area corresponds to the area where potential effects/impacts may occur as a result of the Project.

The Affected Area for paleontological resources lies in the northwestern portion of the Peninsular Ranges geomorphic province, one of 11 major provinces in the state (CGS 2002). The Peninsular Ranges province is characterized by its northwest-trending valleys and faults that branch from the San Andreas fault zone (CGS 2002). The Peninsular Ranges consist of rocks from the Paleozoic

(approximately 542 million to 251 million years ago [mya]) to late Cenozoic (approximately 65.5 mya to the present), including a large Jurassic (approximately 199.6 to 145.5 mya) to Cretaceous (approximately 145.5 to 65.5 mya) batholith that intrudes an older Triassic (approximately 251 and 199.6 mya) metasedimentary sequence (Kennedy et al. 2007). The batholith is predominately composed of tonalite, gabbro, and granodiorite, and granite plutonic igneous rock (Todd et al. 2003). The Affected Area for paleontological resources is located on the wedge-shaped central block of the Los Angeles Basin where Cretaceous to Holocene (approximately 11,477 years ago [ya] to the present) sedimentary rocks unconformably overlie crystalline basement rocks (Roffers and Bedrossian 2010; Saucedo et al. 2007, 2016; Yerkes et al. 1965). The Los Angeles Basin is a structural basin that contains sediments that range in thickness from just a few feet to as much as 31,000 feet in some places (Yerkes et al. 1965). Throughout the basin, Quaternary sediments are mapped at the surface (Roffers and Bedrossian 2010; Saucedo et al. 2007, 2016).

The Affected Area for paleontological resources includes one geologic unit mapped at the surface. Quaternary younger alluvium, unit 2 (Qya_2; Campbell et al. 2014; Saucedo et al. 2016). This alluvial unit is composed of Holocene sediments at the surface. In the subsurface, the Holocene alluvial deposits overlie older late Pleistocene (approximately 126,000 to 11,477 ya) sediments at a depth as shallow as 5 feet bgs (McLeod 2017, 2018). This unit is therefore considered to have high paleontological sensitivity at depths at or below 5 feet.

Fossil Localities

Paleontologists normally distinguish invertebrate from vertebrate fossil localities (as opposed to the archaeological term "site") as each typically requires a different research approach. Invertebrate localities, especially when they comprise microscopic species such as diatoms, foraminifera, and radiolarians, but also when they include larger shelly marine fauna (e.g., clams), can require extensive bulk sediment sampling and processing. In addition, invertebrate fossils normally occur in marine lithologies, can be widespread and abundant, and are often well preserved. They tend to contain fewer separate hard parts subject to loss or destruction after death. In contrast, vertebrate fossils can be marine or nonmarine in origin, comprise large and/or small taxa (e.g., whales to rodents) that are locally distributed, numerically scarce (i.e., few individuals), and be poorly preserved. They tend to contain hundreds of separate hard parts (skeletal elements) that are easily lost or destroyed after death.

4.14.2 Affected Environment/Existing Conditions

A summary of the built environment and archaeological historic properties and historical resources in the APE and the sensitivity of the Affected Area for paleontological resources is included below.

4.14.2.1 Built Environment Historic Properties and Historical Resources

The built environment existing conditions of the APE are presented in detail in the Cultural Resources Survey Report. The study presented in the Cultural Resources Survey Report included the delineation of the APE (described in Section 4.14.1.2 and displayed in Figure 4.14-1), archaeological and built environment field surveys, archival and background research inclusive of a California Historical Resources Information System records search, Assembly Bill 52 and Section 106 consultation, and the documentation and evaluation of 454 properties for historic designation.

A detailed APE map, that identifies all properties recorded and evaluated as part of the study is included as Appendix A of the Cultural Resources Survey Report. The APE map may additionally be cross referenced with Appendix E of the Cultural Resources Survey Report,

which includes a table that lists all of the properties evaluated for the study, along with their associated finding. Of the 454 properties documented and evaluated as part of the study, 386 were recommended ineligible for historic designation. The study additionally identified 229 properties that were found to no longer retain integrity sufficient to warrant consideration for NRHP or CRHR eligibility. Properties exempted from formal evaluation are documented in Appendix H of the Cultural Resources Survey Report.

Built Environment Historic Properties

Identified in yellow in Figure 4.14-1 and listed in Table 4.14.2, the Cultural Resources Survey Report identified 54 properties in the APE that are listed, determined, or assumed eligible for listing in the NRHP. Table 4.14.1 identifies the number of built environment historic properties located in each of the four project alternatives. As properties listed in, determined, or assumed eligible for listing in the NRHP, they are considered historic properties for the purposes of Section 106 and historical resources under CEQA.

Table 4.14.1. Built Environment Historic Properties/Historical Resources by Alternative

Alternative	Built Environment Historic Properties/Historical Resources
Alternative 1	33
Alternative 2	42
Alternative 3	14
Alternative 4	4

Source: Metro 2020d; Metro 2021u

Of the 54 built environment historic properties in the architectural APE, 38 are a single assessor's parcel; a majority of these parcels include one building. One of these historic properties is a structure (Union Pacific Los Angeles River Rail Bridge/Map Reference Number [MRN] 17-006) and five are non-parcel resources consisting of five individual structures (MRNs 2-015, 3-006, 4-001, 5-003, 6-020), which are air raid sirens sited in the public ROW. Ten of the 54 built environment historic properties in the architectural APE are comprised of more than one assessor's parcel; many of these include multiple buildings that function as a single property spanning multiple parcels. Two of these 10 resources are composed of a group of related structures, the Los Angeles Department of Water and Power Boulder Dam to Los Angeles 287.5 kilovolt Transmission Line and the Southern California Edison Long Beach to Laguna Bell Transmission Line (MRNs 17-005 and 18-016).

Several of the 54 historic properties in the architectural APE are contributing resources to historic districts. Eight historic properties in the APE (MRN 2-003, 2-004, 2-005, 2-006, 2-008, 2-009, 2-010, 2-013) are contributors to the potential Downtown Los Angeles Industrial Historic District (MRN 2-018) and one historic property in the APE (MRN 3-030) is a contributor to the potential 7th Street Commercial Historic District (MRN 3-031). The evaluation of the boundaries and significance of these two potential large historic districts was outside the scope of this study, as most parcels that may comprise these districts are outside of the APE for the Project. However, to adequately address potential effects/impacts, the potential Downtown Los Angeles Industrial Historic District and the potential 7th Street Commercial Historic District were assumed eligible for the NRHP for the purposes of this study.

Table 4.14.2. Historic Properties/Historical Resources in the APE

Map Reference No./Property Address or Name	Alternative	Eligibility Criteria (NRHP/CRHR/Local)[1]	Section 106 Finding	CEQA Finding
1-006/900 N. Alameda St.	1	A/1, C/3	No adverse effect	No impact to historical resources
1-007/Los Angeles Union Station	1/ Design Option 1 (MWD)	C/3	No adverse effect	Alt 1: Potentially significant; less than significant impact with mitigation incorporated (CR-6) Design Option 1 (MWD): Less than significant impact to historical resources
2-003/216 S. Alameda St.	1	C/3/3 District: A/1/1	No effect	No impact to historical resources
2-004/701 E. 3rd St.	1	District: A/1/1	No effect	No impact to historical resources
2-005/312 S. Alameda St.	1	District: A/1/1	No effect	No impact to historical resources
2-006/400 S. Alameda St.	1	District: A/1/1	No effect	No impact to historical resources
2-008/422, 426, 430 S. Alameda St.	1	District: A/1/1	No effect	No impact to historical resources
2-009/436 S. Alameda St.	1	District: A/1/1	No effect	No impact to historical resources
2-010/440 S. Alameda St.	1	District: A/1/1	No effect	No impact to historical resources
2-011/500 S. Alameda St.	1	A/1/1, C/3/3	No effect	No impact to historical resources
2-013/542 S. Alameda St.	1	C/3/3 District: A/1/1	No effect	No impact to historical resources
2-015/Air Raid Siren No. 65	2	A/1/1, C/3/3	No effect	No impact to historical resources
3-002/757 S. Flower St.	2	A/1/1, C/3/3	No adverse effect	No impact to historical resources
3-004/801 S. Flower St.	2	3/3	Not applicable (801 S Flower is not a historic property)	Potentially significant; less than significant impact with mitigation incorporated (CR-6)
3-006/Air Raid Siren No. 5	2	A/1/1, C/3/3	No effect	No impact to historical resources
3-007/S. Hope St. Streetlights	2	1/3	Not applicable (S. Hope St. Streetlights is not a historic property)	No impact to historical resources

Map Reference No./Property Address or Name	Alternative	Eligibility Criteria (NRHP/CRHR/Local)[1]	Section 106 Finding	CEQA Finding
3-008/423 W. 8th St.	2	1/1, 3/3	Not applicable (423 W. 8th St. is not a historic property)	No impact to historical resources
3-009/419½ W. 8th St.	2	3/1, 3	Not applicable (419½ W. 8th St. is not a historic property)	No impact to historical resources
3-010/416 W. 8th St.	2	C/3/3	No adverse effect	No impact to historical resources
3-013/313 W. 8th St.	2	A/1/1	No adverse effect	No impact to historical resources
3-014/801 S. Spring St.	2	C/3/3	No adverse effect	No impact to historical resources
3-015/756 S. Spring St.	2	C/3/1, 3	No adverse effect	No impact to historical resources
3-016/S. Main St. Streetlights	2	1, 3 (local)	Not applicable (S. Main St. Streetlights is not a historic property)	No impact to historical resources
3-017/810 S. Spring St.	2	C/3/3	No adverse effect	No impact to historical resources
3-018/752 S. Main St.	2	1/1, 3/3	Not applicable (752 S. Main St. is not a historic property)	Impact to historical resources
3-019/812 S. Spring St.	2	3 (local)	Not applicable (812 S. Spring St. is not a historic property)	No impact to historical resources
3-021/801 S. Los Angeles St.	2	1/1, 3/3	Not applicable (801 S. Los Angeles St.is not a historic property)	No impact to historical resources
3-022/809 S. Los Angeles St.	2	3/3	Not applicable (809 S. Los Angeles St. is not a historic property)	No impact to historical resources
3-023/760 S. Hill St.	2	A/1/1, C/3/3	No adverse effect	No impact to historical resources
3-024/403 W. 8th St.	2	C/3/3	No adverse effect	No impact to historical resources
3-025/301 W. 8th St.	2	District: A/1, C/3	No adverse effect	No impact to historical resources
3-026/756 S. Broadway	2	C/3/1,2,3 District: A/1, C/3	No adverse effect	No impact to historical resources
3-027/800 S. Broadway	2	1, 3 (local) District: A/1, C/3	No adverse effect	No impact to historical resources

Map Reference No./Property Address or Name	Alternative	Eligibility Criteria (NRHP/CRHR/Local)[1]	Section 106 Finding	CEQA Finding
3-028/801 S. Broadway	2	1,3 (local) District: A/1, C/3	No adverse effect	No impact to historical resources
3-029/810-830 S. Flower St.	2	A/1/1, C/3/3	No adverse effect	No impact to historical resources
3-030/800 W. 7th St.	2	C/3 District: A/1/1, C/3/3	No adverse effect	Potentially significant; less than significant impact with mitigation incorporated (CR-6)
4-001/Air Raid Siren No. 10	2	A/1/1, C/3/3	No adverse effect	No impact to historical resources
4-007/508 E. 8th St.	2	C/3/3	No effect	No impact to historical resources
4-021/740-746 Towne Ave.	2	1/1	Not applicable (740-746 Towne Ave. is not a historic property)	No impact to historical resources
4-037/315 E. 8th St.	2	B/2/2, C/3/3	No effect	No impact to historical resources
4-038/217 E. 8th St.	2	C/3/2, 3	No adverse effect	No impact to historical resources
4-039/840 S. Santee St.	2	A/1/1, C/3/3	No adverse effect	No impact to historical resources
5-003/Air Raid Siren No. 189	1/2	A/1/1, C/3/3	No effect	No impact to historical resources
5-004/1753 E. Olympic Blvd.	1/2	C/3/3	No adverse effect	No impact to historical resources
5-005/1731 E. Olympic Blvd.	1/2	C/3	Not applicable (1731 E. Olympic Blvd. is not a historic property)	No impact to historical resources
5-009/1250 Long Beach Ave.	1/2	C/3/3	No adverse effect	No impact to historical resources
5-010/Los Angeles Union Terminal District	1/2	A/1, C/3	Alt 1: No adverse effect Alt 2: No adverse effect	Alt 1: No impact to historical resources Alt 2: Potentially significant; less than significant impact with mitigation incorporated (CR-6)
6-004/1608 East 15th St.	1/2	C/3/3	No adverse effect	No impact to historical resources
6-006/1600 Compton Ave.	1/2	C/3/3	No adverse effect	No impact to historical resources
6-014/2001 South Alameda St.	1/2	C/3/3	No adverse effect	No impact to historical resources

Map Reference No./Property Address or Name	Alternative	Eligibility Criteria (NRHP/CRHR/Local)[1]	Section 106 Finding	CEQA Finding
6-020/Air Raid Siren No. 70	1/2	A/1/1, C/3/3	No adverse effect	Impact to historical resources
8-013/ Pueblo Del Rio Public Housing Complex Historic District (portion of)	1/2	A/1/1, C/3/3	No adverse effect	No impact to historical resources
9-015/1978 Belgrave Ave.	1/2/3	C/3/3	No adverse effect	No impact to historical resources
10-012/6101 Santa Fe Ave.	1/2/3	C/3/3	No adverse effect	No impact to historical resources
10-017/2860 Randolph St.	1/2/3	C/3/3	No adverse effect	No impact to historical resources
11-016/So. Cal. Edison Randolph Substation	1/2/3	C/3/3	No adverse effect	No impact to historical resources
11-018/6300-6302 State St.	1/2/3	C/3/3	No adverse effect	No impact to historical resources
13-001/6231 Maywood Ave.	1/2/3	3/3	Not applicable (6231 Maywood Ave. is not a historic property)	No impact to historical resources
13-003/3477 East Gage Ave.	1/2/3	3/3	Not applicable (3477 East Gage Ave. is not a historic property)	No impact to historical resources
17-005/LADWP Boulder Dam-Los Angeles 287.5 kV Transmission Line	1/2/3	A/1, C/3	No adverse effect	No impact to historical resources
17-006/Union Pacific Los Angeles River Rail Bridge	1/2/3	C/3/E	No adverse effect	No impact to historical resources
18-016/ So. Cal. Edison Long Beach to Laguna Bell Transmission Line (portion of)	1/2/3	A/1, C/3	No adverse effect	No impact to historical resources
19-013/Rancho Los Amigos Medical Center Historic District (portion of)	1/2/3	A/1	No adverse effect	No impact to historical resources

Map Reference No./Property Address or Name	Alternative	Eligibility Criteria (NRHP/CRHR/Local)[1]	Section 106 Finding	CEQA Finding
21-027/I-105-Century Freeway-Transitway Historic District (portion of)	1/2/3/4	A/1, C/3	No adverse effect	Less than significant impact to historical resources
24-001/14813-14819 Paramount Blvd.	1/2/3/4	C/3	No adverse effect	No impact to historical resources
28-008/Bellflower Pacific Electric Railway Depot	1/2/3/4	A/1, C/3	No adverse effect	No impact to historical resources
28-009/10040 Flora Vista St.	1/2/3/4	C/3	No adverse effect	No impact to historical resources
32-021/18644 Alburtis Ave.	1/2/3/4	3 (local)	Not applicable (18644 Alburtis Ave. is not a historic property)	No impact to historical resources

Source: Metro 2021u

Notes: APE = Area of Potential Effects; CEQA = California Environmental Policy Act; CRHR = California Register of Historical Resources: kV = kilovolt; NRHP = National Register of Historic Places

[1] Eligibility criteria are presented with NRHP criterion first, followed by CRHR criterion and then local criterion (for example: A/1/1); see the Regulatory Setting and Methodology (Section 4.14.1) of this Chapter and/or the Cultural Resources Effects Report for further description of NRHP, CRHR, and applicable local eligibility criteria.

Four of the historic properties in the APE (MRN 3-024, 3-026, 3-027, 3-028) are contributors to the NRHP/CRHR-listed Broadway Theater and Commercial Historic District (MRN 3-032). Two of the historic properties in the APE comprise large portions of listed/determined eligible historic districts; these are Pueblo del Rio Public Housing Complex Historic District (MRN 8-013) and the I-105/Century Freeway-Transitway Historic District (MRN 21-027). The Los Angeles Union Terminal Buildings Historic District (5-010) and the Rancho Los Amigos Medical Center Historic District (19-013) are entirely within the APE.

Built Environment Historical Resources

As noted above, all of the historic properties in the APE are also historical resources for the purposes of CEQA. Identified in Figure 4.14-1 in green and listed in Table 4.14.3, the architectural APE additionally includes 14 properties that are ineligible for listing in the NRHP but eligible for the CRHR and/or local designation. Table 4.14.4 identifies the number of built environment historical resources located in each for the four project alternatives. As properties only eligible for listing in the CRHR and/or for local designation, they are considered historical resources for the purposes of CEQA and are not historic properties under Section 106 of the NHPA.

Table 4.14.3. Archaeological Historic Properties/Historical Resources by Alternative

Alternative	Archaeological Historic Properties/Historical Resources Located in Associated APE
Alternative 1	8
Alternative 2*	1
Alternative 3*	1
Alternative 4	0

Source: Metro 2020d; Metro 2021u
Notes: * = The archaeological historic property located in this alternative is a linear resource also located in Alternative 1.
APE = Area of Potential Effects

Table 4.14.4. Built Environment Historical Resources by Alternative

Alternative	Additional Built Environment Historical Resources	Total Built Environment Historical Resources
Alternative 1	4	37
Alternative 2	14	56
Alternative 3	3	17
Alternative 4	1	5

Source: Metro 2020d; Metro 2021u

Of these 14 historical resources, 11 are composed of a single assessor's parcel on which one building is sited. One of the resources, 740-7406 Towne Avenue (MRN 4-021), is comprised of two assessor's parcels on which two buildings are sited. Two of the resources are non-parcel resources (MRN 3-007 and 3-016) consisting of light standards sited in the public ROW. One of the resources, 18644 Alburtis Avenue (MRN 32-021), is a contributor to the Artesia Historic District, a locally eligible historic district.

4.14.2.2 Archaeological Historic Properties/Historical Resources

Eight previously identified archaeological historic properties/historical resources in the direct APE (Primary Number [P]-19-001575, P-19-002849, P-19-003181, P-19-003588, P-19-003862, P-19-004171, P-19-004201, P-19-004202) were identified by the Cultural Resources Survey Report. During the archaeological survey performed for the study, ground visibility was poor (less than 10 percent) throughout the direct APE due to its developed nature, including the presence of rail track and ballast, buildings and structures, pavement, and/or landscaping. No archaeological resources were identified on the surface in the direct APE during the survey. All of the previously identified archaeological historic properties/historical resources are located in developed areas that contain no exposed ground surface, and they were encountered during ground-disturbing construction activities associated with previously conducted projects. Noted in Table 4.14.3, all eight of the archaeological historic properties/historical resources in the APE are located in the direct APE for Alternative 1. One of the archaeological historic properties/historical resources, a linear resource, is also located in the APE for Alternatives 2 and 3. No identified archaeological historic properties/historical resources are located in the APE for Alternative 4. Brief descriptions of each of the archaeological historic properties/historical resources in the APE are provided in Table 4.14.5.

Table 4.14.5. Archaeological Historic Properties/Historical Resources in the APE

Primary Number	Alternative	Description	Eligibility Status/ Eligibility Criteria (NRHP/CRHR)	Section 106 Finding	CEQA Finding
P-19-002849	1/2/3	Linear resource; historic-period utility line; recorded approx. 17-inches below grade	Presumed eligible for NRHP and CRHR-D/4*	Potential adverse effect	Potentially significant impact; less than significant with mitigation incorporated (CR-1 and CR-2)
P-19-003181	1	Historic-period concrete foundation and associated artifact scatter; recorded portion is below buildings and pavement	Presumed eligible for NRHP and CRHR-D/4	Potential adverse effect	Potentially significant impact; less than significant with mitigation incorporated (CR-1 and CR-2)
P-19-003588	1	Historic-period brick foundations and associated deposit of artifacts; recorded below grade within 1 foot	Presumed eligible for NRHP and CRHR-D/4	No adverse effect	Less than significant impact to historical resources

Primary Number	Alternative	Description	Eligibility Status/ Eligibility Criteria (NRHP/CRHR)	Section 106 Finding	CEQA Finding
P-19-003862	1	Historic-period, single-layer brick alignment; recorded approx. 2.0 to 2.5 feet below grade	Presumed eligible for NRHP and CRHR-D/4	No adverse effect	Less than significant impact to historical resources
P-19-004171	1/Design Option 2	Historic-period features and refuse deposits; site extends at least 7 feet below grade	Presumed eligible for NRHP and CRHR-D/4	Alternative 1: No adverse effect Design Option 2: Potential adverse effect	Alternative 1: Less than significant impact to historical resources Design Option 2: Potentially significant impact; less than significant with mitigation incorporated (CR-1 and CR-2)
P-19-004201	1	Five historic-period features; potentially present below current urban landscape	Presumed eligible for NRHP and CRHR-D/4	No adverse effect	No impact to historical resources
P-19-004202	1	Historic-period features associated with railroad; recorded approx. 7 feet below grade	Presumed eligible for NRHP and CRHR-D/4	Potential adverse effect	Potentially significant impact; less than significant with mitigation incorporated (CR-1 and CR-2)
P-19-001575	1	Multicomponent historic and prehistoric site; recorded below developed portions of LAUS property	Determined eligible for NRHP; listed in CRHR-D/4	Potential adverse effect	Potentially significant impact; less than significant with mitigation incorporated (CR-1 and CR-2)

Source: Metro 2020d; Metro 2021u
Notes: APE = Area of Potential Effects; CEQA = California Environmental Quality Act; CRHR = California Register of Historical Resources; LAUS = Los Angeles Union Station; NRHP = National Register of Historic Resources
*= Eligibility criteria are presented with NRHP Criterion first, followed by CRHR Criterion; see the Regulatory Setting and Methodology (Section 4.14.1) of this Chapter for further description of NRHP and CRHR eligibility criteria.

As noted above, the APE is developed and includes a variety of hardscaping and structures, thereby limiting ground surface visibility and access to archaeological historic properties/historical resources for study. Testing of properties/resources prior to the selection of an alternative is infeasible given the cost and effort necessary to conduct testing, such as an Extended Phase I or Phase II study. Under the existing conditions, testing efforts would require the removal of hardscaping and developments (e.g., roads and structures) potentially causing a significant disruption to needed infrastructure and commerce. As such, testing to assess the existing conditions of resources within the APE was not feasible. An archaeological survey of the direct APE was conducted for the Project. However, the eight sites known to have previously existed are located below modern development, and the survey did not identify any archaeological resources on the surface in the direct APE during the survey. Therefore, the analysis presented in the Cultural Resources Survey Report is based on existing documentation from efforts occurring during previous developments. While it is assumed that they remain, it is likely that previously recorded resources may have been removed during previous development and may no longer be extant.

4.14.2.3 Paleontological Resources

The paleontological records search conducted for this study indicates the Natural History Museum of Los Angeles County (NHMLAC) does not have any fossil localities that lie directly within the Affected Area for paleontological resources, but they do have vertebrate localities nearby from the same sedimentary deposits that occur in the subsurface below the Affected Area (McLeod 2017, 2018). Twenty-one previously recorded vertebrate fossil localities have been identified within Quaternary (approximately 1.806 ± 0.005 mya) older alluvium near the Affected Area. Most of the localities were identified in areas mapped at the ground surface as Quaternary younger (Holocene) alluvium, where age of the Quaternary sediments increases with depth. Depth of discovery within these localities varies between 5 feet to over 40 feet. At least one locality (LACM 3347) was recorded at less than 2 feet bgs in Quaternary older alluvium mapped at ground surface. Combined, these localities have yielded several specimens of mammoth, ground sloth, saber-toothed cat, dire wolf, horse, camel, deer, antelope, rabbit, rodent, reptile, salamander, turkey, shark, and bony fish.

Two additional localities have been previously recorded near the Affected Area for paleontological resources from older sedimentary units that may occur at depth below the Quaternary alluvium mapped in downtown Los Angeles near Alternatives 1 and 2. These localities produced vertebrate fossil specimens from the Miocene (approximately 23.03 to 5.33 mya) Puente Formation and Pliocene (approximately 5.33 to 1.81 mya) Fernando Formation, including specimens of at least 10 different taxa of bony fish. Depth of discovery within these localities is not provided.

NHMLAC fossil collections records for the Affected Area for paleontological resources accord with the scientific record of abundant and diverse vertebrate fauna previously identified within similar Pleistocene (approximately 1,806,000 to 11,477 ya) sediments in Southern California (Agenbroad 2003; Bell et al. 2004; Brattstrom and Sturn 1959; Koch et al. 2004; Jefferson 1985, 1991; Maguire and Holroyd 2016; Merriam 1911; Reynolds et al. 1991; Savage et al. 1954; Scott and Cox 2008; Springer et al. 2009; Steadman 1980; Tomiya et al. 2011; Wilkerson et al. 2011; Winters 1954). Based on depth of previous fossil discoveries in the area (McLeod 2017, 2018), the Quaternary younger (Holocene) alluvium mapped at the surface of the Affected Area is underlain by older Quaternary (Pleistocene) fossil-bearing alluvium at

depths as shallow as 5 feet bgs. The entire Affected Area is thus considered to have high paleontological sensitivity at depths at or below 5 feet.

4.14.3 Environmental Consequences/Environmental Impacts

The following section presents a summary of the analysis of effects for the No Build Alternative and operation of Build Alternatives (i.e., 1, 2, 3, and 4), including Design Options 1 and 2, and the Paramount and Bellflower MSF site options.

4.14.3.1 Built Environment Historic Properties

For the purposes of Section 106 and as detailed below, this section describes the preliminary determinations of effect to built environment historic properties that would result from operation of the Project. After circulation of the Draft EIS/EIR and consideration of public comments, the SHPO would be consulted. Following concurrence from the SHPO, preliminary determinations would become final determinations.

No Build Alternative

Under the No Build Alternative, the Project would not be constructed. The existing transportation network would remain, and planned transportation improvements that have been committed to and identified in Metro's constrained 2009 LRTP (Metro 2009a) and the SCAG RTP/SCS (SCAG 2016a), as well as additional projects funded by Measure M that would be completed by 2042, would be implemented. Under the No Built Alternative, the environmental setting would remain in current conditions, with the addition of currently planned and funded projects. Therefore, there would be no effect to built environment historic properties as a result of the No Build Alternative.

Build Alternatives, Design Options, and MSF Site Options

This subsection presents the potential effects common among Alternatives 1, 2, 3, 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options. Potential operational effects to built environment historic properties in the APE are those directly related to operation of the Project (Alternatives 1, 2, 3, 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options). These potential effects include noise and vibration effects, visual effects, and property acquisitions and easements. The study presented in the Cultural Resources Effects Report (Appendix X) and summarized in the following subsections indicates that operation of the Built Alternatives, design options, and MSF site options would result in no adverse effect to built environment historic properties.

Potential noise and vibration effects related to operation of the Project were evaluated and presented in the Noise and Vibration Impact Analysis Report (Appendix M) prepared for the Project and summarized in Section 4.7, Noise and Vibration, of this Draft EIS/EIR. In relation to built environment historic properties, noise and vibration would have an adverse effect if they were to alter any of the characteristics of a historic property that qualify it for inclusion in the NRHP. Operational noise and/or vibration levels associated with the Project would not result in physical damage to any of the historic properties in the APE. The APE traverses an urbanized environment and operational noise and/or vibration associated with the Project would not change the character of use or diminish the integrity of any of the significant features of historic properties in the APE. Operational noise and/or vibration associated with the Project would not alter the characteristics of any of the historic properties

in the APE that qualify them for inclusion in the NRHP and therefore would result in no adverse effects.

Operation of the Project would require structures and equipment that would add new visual elements to the existing urban landscape that comprises the APE. Visual elements that would be introduced due to operation of the Project include station entrances, catenary poles and wires, aerial rail structures, TPSSs, and sound walls. These new features would be contemporary in design and therefore would be differentiated from historic-period features. However, as the entire APE is within an already urban setting, the new features would be in keeping with the existing setting and would not change the character of a historic property's use or the physical features within their setting that contribute to their historic significance. New features would not block significant views to or from historic properties in the APE. The introduction of new visual elements such as those noted above as a result of operation of the Project would not diminish the integrity of any built environment historic properties in the APE and therefore would result in no adverse effect.

The potential effects discussed above are generally consistent among Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options. Therefore, they are not discussed in detail in the subsections below. The following subsections discuss the potential effects of project operation that are unique to Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options.

Alternative 1: Los Angeles Union Station to Pioneer Station

There are 33 built environment historic properties located in the APE for Alternative 1. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 1 would result in no adverse effect to built environment historic properties. As noted previously, potential noise, vibration, and visual effects due to the introduction of project features associated with operation of Alternative 1 would not alter any of the characteristics of the historic properties in the APE that qualify them for inclusion in the NRHP or the physical features within their setting that contribute to their significance.

Many of the historic properties in the northern portion of Alternative 1 require a permanent (partial) easement for the operation of the rail tunnel proposed under this alternative. However, the tunnel would not change the character of use or alter the significant historic features of any of the historic properties in the APE. The tunnel would be significantly below grade and would not result in visual change to any of the historic properties in the APE or their settings.

There are two built environment historic properties in the APE for Alternative 1 that would be physically altered by its operation: LAUS/MRN 1-007 and I-105/Century Freeway-Transitway Historic District/MRN 21-027. Under Alterative 1, a station entrance would be constructed within the boundaries of LAUS. Although alteration would occur within the boundaries of LAUS, the main terminal building, the district's primary contributing feature, would not be altered by operation of Alternative 1. The proposed station entrance would be sited 65 feet from the LAUS main terminal building. Additionally, the proposed station entrance would be modest in scale and massing when compared to that of the LAUS property as a whole. To further reduce potential effects, the proposed station entrance would be designed in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (SOI Standards). The addition and operation of a station entrance within the boundaries of LAUS would not change the character of the property's transportation-related use or physical features that contribute to its significance. Alternative 1 would not

diminish the integrity of the significant historic features of LAUS and no adverse effect would occur.

In addition to LAUS, operation of Alternative 1 would result in the physical alteration of a small portion of the I-105/Century Freeway-Transitway Historic District. Proposed modifications to the district under Alternative 1 include: the demolition and reconstruction of three contributing bridges, construction of an additional bridge (LRT bridge) to accommodate the Alternative 1 alignment, realignment of approximately 2,500 feet of C-Line track and I-105 traffic lanes, and the introduction of an infill station and associated elements of vertical circulation.

The extant bridges (to be demolished and replaced under Alternative 1) were constructed in 1988 with contemporary materials and design. They are 3 of the 118 bridges that are contributing to the district (less than 3 percent). While the bridges are identified as contributing features, they are not individually eligible and are not noteworthy for their architectural style or design. Additionally, they are not identified (by Caltrans in its condition assessment report for the district) as one of the district's most significant features. Although the (replacement) Century Boulevard underpass may be up to 35 feet wider than the current Century Boulevard underpass, replacement bridges would be generally consistent in their scale and massing with existing bridges.

Alternative 1 would add an additional bridge within the boundaries of the district. However, the LRT bridge would be sited immediately adjacent to the (replacement) Century Boulevard Bridge and these bridges would be unified in their scale and massing, which would result in their presentation almost as a single structure. As such, despite replacement of three bridges and the addition of the LRT bridge, the rhythm, spacing, and general location of bridges within the district would not be altered by Alternative 1.

The C Line and I-105 traffic lanes run the length of the district (18.1 miles). Although they are proposed for realignment under Alternative 1, realignment would alter a maximum of 2,500 feet (less than 3 percent) of C-Line track and I-105 lanes. The C Line track and I-105 lane realignment would not alter the district's transportation function or result in major changes to physical features within the property's setting that contribute to its historic significance.

Alternative 1 would introduce an infill station and associated elements of vertical circulation within the district. However, the addition of the infill C-Line Station in the center of the I-105 is consistent with the overall form and function of the district as an intermodal transit system. The historic district includes 10 other light rail stations within its boundaries. The proposed infill station would be consistent in its placement (in the center of the median) and function with other stations throughout the district. While the new infill station would be consistent with existing stations in terms of location and accessibility features, it would also differentiate itself in its design; other stations in the district are Post-Modern inspired. The infill station would feature a more contemporary design.

Operation of Alternative 1 would not result in damage to the I-105/Century Freeway-Transitway Historic District. While demolition would occur within the district, demolished features would be replaced in a manner consistent with those currently extant. None of the alterations proposed within the district would alter the character of use of the district. As an intermodal freeway, the proposed additions are consistent with the historic and current use of the district. Operation of Alternative 1 would not change the character of physical features within the property's setting that contribute to its historic significance. Despite the alterations

proposed under Alternative 1, the district overall would retain integrity of location, setting, design, materials, workmanship, feeling and association. Under NEPA, operation of Alternative 1 would result in no adverse effect to built environment historic properties.

Alternative 2: 7th Street/Metro Center to Pioneer Station

There are 42 built environment historic properties located in the APE for Alternative 2. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 2 would result in no adverse effects to built environment historic properties. As the APE for Alternative 2 includes nine more historic properties than the APE for Alternative 1, the potential for effects to built environment historic properties to occur is greater under Alternative 2 than under Alternative 1.

The analysis related to potential noise, vibration, and visual effects resulting from project features presented above is applicable to Alternative 2. Additionally, three built environment historic properties in the APE for Alternative 2 would be physically altered by its operation: LA Union Terminal/MRN 5-010, the Barker Brothers Building/MRN 3-030, and I-105/ Century Freeway-Transitway Historic District/21-027. One of the historic properties that would be physically altered by the operation of Alternative 2 (I-105/Century Freeway-Transitway Historic District) is also in the APE for Alternative 1 and would be consistently altered under both alternatives. Therefore, the analysis related the I-105/Century Freeway-Transitway Historic District presented above is applicable to Alternative 2.

Additionally, under Alternative 2, a station entrance would be constructed within the boundaries of the LA Union Terminal, and a pedestrian tunnel would be constructed in the basement of the Barker Brothers Building. The proposed station entrance and pedestrian tunnel noted above would not change the character of use of the LA Union Terminal, the Barker Brothers Building, or any of the historic properties in the APE. These elements would be designed in conformance with the SOI Standards and they would not diminish the integrity of the significant historic features of properties in the APE. Therefore, adverse effects would be avoided.

Many of the historic properties in the northern portion of Alternative 2 require a permanent (partial) easement for the operation of the rail tunnel proposed under this alternative. However, the tunnel would not change the character of use or alter the significant historic features of any of the historic properties in the APE. The tunnel would be significantly below grade and would not result in visual change to any of the historic properties in the APE or their settings. Under NEPA, the operation of Alternative 2 would result in no adverse effect to built environment historic properties.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

There are 14 built environment historic properties located in the APE for Alternative 3. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project and summarized above, operation of Alternative 3 would result in no adverse effect to built environment historic properties. The APE for Alternative 3 includes 19 fewer historic properties than the APE for Alternative 1 and 29 fewer historic properties than the APE for Alternative 2. Therefore, potential effects to built environment historic properties are significantly less under Alternative 3 than Alternatives 1 and 2.

The analysis related to potential noise, vibration, and visual operational effects resulting from project features presented above is applicable to Alternative 3. Additionally, there is one historic

property in the APE for Alternative 3 that would be physically altered by its operation: I-105/Century Freeway-Transitway Historic District/21-027. This historic property is also in Alternatives 1 and 2. As proposed modifications to the I-105/Century Freeway-Transitway Historic District under Alternative 3 would be consistent with those proposed under Alternatives 1 and 2, the analysis presented above for Alternative 1 is applicable to Alternative 3.

A majority of the historic properties in the APE for Alternative 3 would not require easements. However, a minimal number of sliver acquisitions are necessary. Sliver acquisitions are small-scale acquisitions that may be necessary to accommodate operation of Alternative 3. These easements would not result in damage to or change the character of use or physical features of any of the historic properties in the APE that contribute to their significance. Under NEPA, operation of Alternative 3 would result in no adverse effect to built environment historic properties.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Four built environment historic properties are located in the APE for Alternative 4. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 4 would result in no adverse effect to built environment historic properties. The APE for Alternative 4 includes 29 fewer historic properties than the APE for Alternative 1, 39 fewer historic properties than the APE for Alternative 2, and 11 fewer historic properties than the APE for Alternative 3. Therefore, the potential for effects to built environment properties is least under Alternative 4.

The analysis related to potential noise, vibration, and visual operational effects resulting from project features presented above is applicable to Alternative 4. There are no historic properties in the APE for Alternative 4 that require permanent easements. Consistent with Alternative 3, one historic property in the APE for Alternative 4 would be directly altered physically by its operation: the I-105/Century Freeway-Transitway Historic District/21-027. This historic property is also in Alternatives 1, 2, and 3. As modifications to the I-105/ Century Freeway-Transitway Historic District under Alternative 4 would be consistent with those proposed under Alternatives 1, 2, and 3, the analysis presented above for Alternative 1 is applicable to Alternative 4. Under NEPA, operation of Alternative 4 would result in no adverse effect to historic properties.

Design Options—Alternative 1

Design Option 1: LAUS at MWD: The potential for effects as a result of operation of Design Option 1 (MWD) and Alternative 1 are generally consistent, and there is not an increased potential for effects to built environment historic properties resulting from operation of Alternative 1 with Design Option 1 (MWD) when compared to Alternative 1 without Design Option 1 (MWD).

The analysis related to potential noise, vibration, and visual operational effects resulting from project features presented above is applicable to Design Option 1 (MWD). Additionally, operation of Design Option 1 (MWD) would require a permanent, partial underground easement below LAUS/MRN 1-007. However, the addition of the tunnel would not diminish the integrity of the LAUS property because it would be located significantly below grade and therefore would not result in any visual alteration to the property. In addition to the underground easement, permanent above-grade ventilation grating would be added to LAUS under Design Option 1 (MWD). Ventilation grating would be installed flush with the existing

paved surfaces on the property and would not detract from or significantly alter the property's already urban environment.

Project operations would not change the use or alter the historic characteristics of any of the extant built environment historic properties, including LAUS, in a manner that would diminish their integrity of location, design, setting, materials, workmanship, feeling, or association. Existing built environment historic properties would continue to convey their significance. Under NEPA, operation of Design Option 1 (MWD) would result in no adverse effect to built environment historic properties.

Design Option 2: Add Little Tokyo Station: The potential for effects as a result of operation of Design Option 2 and Alternative 1 are generally consistent, and there is not an increased potential for effects to built environment historic properties resulting from operation of Alternative 1 with Design Option 2 when compared to Alternative 1 without Design Option 2.

No built environment historic properties are located in the immediate vicinity of the proposed Little Tokyo Station, which would be constructed below grade under Design Option 2. 216 South Alameda Street/MRN 2-003, the historic property most proximately located to the proposed station, is approximately 140 feet from the Little Tokyo Station southern underground station access. However, the station entrance would be visually blocked from 216 South Alameda Street by MRN 2-002 and physically separated from it by East Second Street and no effects would result. Under NEPA, operation of Design Option 2 would result in no effect to built environment historic properties.

Maintenance and Storage Facility

Paramount MSF Site Option: Permanent acquisitions and/or easements may be required for operation of the Paramount MSF site option. However, no permanent acquisitions and/or easements of built environment historic properties are proposed. No built environment historic properties are located within the proposed construction footprint of the Paramount MSF site option. However, the Paramount MSF site option is located 450 feet west of (to the rear) of one historic property: Our Lady of the Rosary Church/MRN 24-001.

The eligibility of Our Lady of the Rosary Church is related to its architecture, which would not be altered by operation of the Paramount MSF site option. The property on which Our Lady of the Rosary Church is located would not be physically altered by operation of the Paramount MSF site option. However, the Paramount MSF site option would introduce new visual elements to the vicinity of the historic property. New elements would not significantly alter the visual character and quality of the area or reduce the property's integrity. The property on which the Paramount MSF site option is proposed is currently occupied with mixed commercial and industrial use and a variety of buildings and structures that include a large-scale abandoned industrial site. Therefore, the Paramount MSF would not further alter the existing visual character and setting of Our Lady of the Rosary Church. Operation of the Paramount MSF would result in no adverse effect to built environment historic properties.

Bellflower MSF Site Option: Permanent acquisitions and/or easements may be required for operation of the Bellflower MSF site option. However, no permanent acquisitions and/or easements of built environment historic properties are proposed. No built environment historic properties are located in the vicinity of the proposed Bellflower MSF site option. The closest historic property is Our Lady of the Rosary Church/MRN 24-001, which is approximately 1-mile northwest of the proposed Bellflower MSF. Operation of the Bellflower

MSF would therefore result in no effect to built environment historic properties. When comparing the potential for effects to built environment historic properties associated with operation of the Paramount and Bellflower MSF site options, operation of the Paramount MSF has a greater potential for effects due to the presence of one as opposed to zero historic properties in its vicinity.

4.14.3.2 Archaeological Historic Properties

As detailed below, FTA for the purposes of Section 106 has made the following preliminary determinations that are based on the analysis presented in the Cultural Resources Effects Report (Appendix X) prepared for the Project. Operation of Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options would result in no effect to archaeological historic properties.

No Build Alternative

Under the No Build Alternative, the Project would not be constructed. The existing transportation network would remain and planned transportation improvements that have been committed to and identified in the constrained 2009 LRTP and SCAG's RTP/SCS, as well as additional projects funded by Measure M that would be completed by 2042, would be implemented. Under the No Build Alternative, no new ground disturbance would result from operation of the Project because the Project would not be constructed, and the environmental setting would remain in current conditions (with the addition of currently planned and funded projects). As there would be no ground disturbance under the No Build Alternative, no effect to known or unanticipated archaeological resources would occur.

Build Alternatives

Under the Build Alternatives there would be minimal, if any, ground disturbance associated with the ongoing maintenance and operation of the Project. Additionally, noise, vibration, and visual effects associated with the ongoing maintenance and operation of the Project are not expected to affect archaeological resources under the Build Alternatives. Therefore, there would be no effect to archaeological historic properties as a result of operation of the Build Alternatives. The potential for effects to archaeological historic properties is greatest under Alternative 1 due to its length and number of archaeological historic properties present within its APE. The potential for effects to archaeological historic properties is less under Alternatives 2, with one known archaeological historic property in its APE, than under Alternative 1. The potential for effects to archaeological historic properties is less under Alternative 3, also with one known archaeological historic property it its APE but with a significantly reduced alignment proposed, than under Alternative 2. The potential for effects to archaeological historic properties is least under Alternative 4, which is the shortest alternative with no known archaeological historic properties in its APE.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Similar to the Build Alternatives, there would be minimal, if any, ground disturbance associated with the ongoing maintenance and operation of Design Options 1 and 2. Additionally, noise, vibration, and visual effects associated with ongoing maintenance and operation of the Project are not expected to affect archaeological resources under Design Options 1 and 2. Therefore, there would be no effect to archaeological historic properties as a result of operation of Design Options 1 and 2. The potential for effects to archaeological historic

properties are consistent between Alternative 1 without Design Options 1 and/or 2 and Alternative 1 with Design Options 1 and/or 2.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: No ground-disturbing activities are proposed at the Paramount or Bellflower MSF site options during operation phase of the Project. Therefore, there would be no effect to archaeological historic properties associated with operation of either MSF site option. The potential for effects to archaeological historic properties are consistent between the Paramount and Bellflower MSF site options.

4.14.3.3 Paleontological Resources

No Build Alternative

Under the No Build Alternative, the Project would not be constructed. The existing transportation network would remain and planned transportation improvements that have been committed to and identified in the constrained 2009 LRTP and SCAG's RTP/SCS, as well as additional projects funded by Measure M that would be completed by 2042, would be implemented. Under the No Build Alternative, no new ground disturbance would result from operation of the Project because the Project would not be constructed, and the environmental setting would remain in current conditions (with the addition of currently planned and funded projects). The No Build Alternative would result in no effect to paleontological resources.

Build Alternatives

Under NEPA, direct and indirect adverse effects to paleontological resources due to ongoing maintenance and operations under the project alternatives (i.e., Alternatives 1, 2, 3, and 4) would be negligible because there would be minimal, if any, ground disturbance during operation of the Project. As a result, there would be no adverse effect to paleontological resources during operation of the Project. As the entire Affected Area for paleontological resources is considered to have the same paleontological sensitivity (high at depths at or below 5 feet), potential effects to paleontological resources associated with operation of the Build Alternatives is consistent among Alternatives 1, 2, 3, and 4. However, as Alternatives 1 and 2 are significantly longer than Alternatives 3, and 4, the potential for effects is greater under these alternatives. Given its length, the potential for effects to paleontological resources as a result of project operation is least under Alternative 4.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Neither Design Option 1 or 2 would require ground disturbance during operation. Therefore, no adverse effect to paleontological resources would occur as a result of operation of either design option. As noted above, the entire Affected Area for paleontological resources is considered to have a consistent paleontological sensitivity (high at depths at or below 5 feet). Therefore, potential effects to paleontological resources associated with operation of Design Option 1 and 2 are consistent with one another and do not present increased potential for effects when compared to Alternative 1 without Design Option 1 or 2.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: No ground-disturbing activities are proposed at the Paramount or Bellflower MSF site options during operation of the

Project. Therefore, there would be no adverse effect to paleontological resources resulting from operation of either MSF site option. The potential for effects to paleontological resources is consistent between the Paramount and Bellflower MSF site options.

4.14.4 Project Measures and Mitigation Measures

As presented in the analysis in the prior sections, operation of Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options would result in no effect to archaeological historic properties and no adverse effect to paleontological resources. No project measures or mitigation measures are required. Implementation of Mitigation Measure CR-6 (Historic Design Review) is required to reduce potential adverse effects to built environment historic properties related to the operation of Alternative 1 and 2.

CR-6 – Historic Design Review

Project elements with the potential to affect the significance of a historic property or historical resource would be designed in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Rehabilitating Historic Properties. Designs would preserve the character-defining features of the historic property; would avoid minimizing aspects of integrity; and would avoid damaging or destroying materials, features, or finishes that convey significance. Proposed designs would be reviewed by a historic preservation professional that meets the Secretary of the Interior's Professional Qualification Standards for Architectural History, History, or Architecture, and construction activities would require on-site periodic construction monitoring by a historic preservation consultant.

4.14.5 California Environmental Quality Act Determination

The following section summarizes the analysis of impacts for the No Project Alternative and operation of the Build Alternatives (i.e., Alternatives 1, 2, 3, and 4), including the design options and maintenance and storage facility site options.

4.14.5.1 Historic Built Resources

Would the Project cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

No Project Alternative

Under the No Project Alternative, the Project would not be constructed; no new infrastructure would be built within the APE; and the existing freight tracks within the rail ROWs would remain. Under the No Project Alternative, the environmental setting would remain in current conditions. Therefore, the No Project Alternative would result in no impact to built environment historical resources, and mitigation would not be required.

Build Alternatives, Design Options, and MSF Site Options

This subsection presents the potential impacts common among Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options. The study presented in the Cultural Resources Effects Report (Appendix X), and summarized in the following subsections, indicates that operation of the Project would not result in significant impacts to historical resources.

Potential noise and vibration impacts related to operation of the Project were evaluated and presented in the Noise and Vibration Impact Analysis Report (Appendix M) and summarized in Section 4.7, Noise and Vibration, of this Draft EIS/EIR. Consistent with the effects analysis presented above in relation to historical resources, noise and vibration impacts were analyzed based on their potential to significantly impact historical resources. Operational noise and/or vibration associated with the Project would not diminish the integrity of any of the historical resources in the APE and therefore would result in less than significant impacts to built environment historical resources.

Operation of the Project would require structures and equipment that would add new visual elements to the existing urban landscape, including station entrances, catenary poles and wires, aerial rail structures, TPSSs, and sound walls. However, consistent with the effects analysis presented above, the introduction of project-associated features would not materially impair or reduce the integrity of any of the built environment historical resources in the APE.

The potentially significant impacts discussed above are generally consistent among Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options. Therefore, they are not discussed in detail in the alternative-specific subsections below. The subsections that follow discuss the potentially significant impacts of project operation that are unique to Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options.

Alternative 1: Los Angeles Union Station to Pioneer Station

There are 37 built environment historical resources located in the APE for Alternative 1. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 1 would result in less than significant impacts to built environment historical resources with mitigation incorporated (Mitigation Measure CR-6 [Historic Design Review]). As noted in the section above, potential noise, vibration, and visual impacts due to the introduction of project features associated with operation of Alternative 1 would not diminish the integrity of any of the historical resources in the APE.

Many historical resources in the northern portion of Alternative 1 require a permanent (partial) easement for the operation of the rail tunnel proposed under this alternative. However, the addition of the tunnel would not diminish the integrity of any of the historical resources in the APE. The tunnel would be located significantly below grade and, therefore, would not result in visual impacts.

Two built environment historical resources in the APE for Alternative 1 would be physically altered by its operation: LAUS/MRN 1-007 and I-105/Century Freeway-Transitway Historic District/MRN 21-027. Proposed modifications to LAUS and the I-105/Century Freeway-Transitway Historic District are described in detail for Alternative 1 in Section 4.14.3.1.

As required by Mitigation Measure CR-6 (Historic Design Review), the proposed station entrance within the boundaries of LAUS would be designed in conformance with the SOI Standards, thereby resulting in less than significant impacts. Despite the alterations proposed to the I-105/Century Freeway-Transitway Historic District under Alternative 1, following implementation, the district would retain integrity of location, setting, design, materials, workmanship, feeling, and association, and impacts would be less than significant.

Without mitigation, operation of Alternative 1 may result in significant impacts to built environment historical resources. However, with mitigation, operation of Alternative 1 would result in less than significant impacts to built environment historical resources.

Mitigation Measures: Mitigation Measure CR-6 (Historic Design Review)

Impacts Remaining After Mitigation: Less than significant.

Alternative 2: 7th Street/Metro Center to Pioneer Station

There are 56 built environment historical resources located in the APE for Alternative 2. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 2 would result in less than significant impacts to built environment historical resources with mitigation incorporated (Mitigation Measure CR-6 [Historic Design Review]). As the APE for Alternative 2 includes 19 more historical resources than the APE for Alternative 1, the potential for impacts to built environment historic properties is greater under Alternative 2 than under Alternative 1.

As noted previously, potential noise, vibration, and visual impacts due to the introduction of project features associated with operation of Alternative 2 would diminish the integrity of any of the historical resources in the APE. Many historical resources in the northern portion of Alternative 2 require a permanent (partial) easement for the operation of the rail tunnel proposed under this alternative. However, the addition of the tunnel would not diminish the integrity of any of the historical resources in the APE. The tunnel would be located significantly below grade and, therefore, would not result in any visual impacts.

Four historical resources in the APE for Alternative 2 would be physically altered by its operation: LA Union Terminal/MRN 5-010, the Barker Brothers Building/MRN 3-030, 801, South Flower Street/MRN 3-004, and the I-105/Century Freeway-Transitway Historic District/MRN 21-027. One of the historic properties that would be physically altered by the operation of Alternative 2 (I-105/Century Freeway-Transitway Historic District) is also in the APE for Alternative 1 and would be similarly altered under both alternatives. Despite the alterations proposed to the I-105/Century Freeway-Transitway Historic District under Alternative 2, following implementation, the district would retain integrity of location, setting, design, materials, workmanship, feeling, and association, and impacts would be less than significant.

Additionally, under Alternative 2, station entrances would be constructed within the boundaries of the LA Union Terminal and 801 South Flower Street, and a pedestrian tunnel would be constructed in the basement of the Barker Brothers Building. The proposed station entrances and pedestrian tunnel noted above would not change the character of use of these historical resources, nor would they introduce elements that would diminish the integrity of the historical resources in the APE. As required by Mitigation Measure CR-6 (Historic Design Review), these elements would be designed in conformance with the SOI Standards, thereby resulting in less than significant impacts.

Without mitigation, operation of Alternative 2 may result in significant impacts to built environment historical resources. However, with mitigation incorporated, operation of Alternative 2 would result in less than significant impacts to built environment historical resources.

Mitigation Measures: Mitigation Measure CR-6 (Historic Design Review)

Impacts Remaining After Mitigation: Less than significant.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

There are 17 built environment historical resources located in the APE for Alternative 3. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 3 would result in less than significant impacts to built environment historical resources. The APE for Alternative 3 includes 20 fewer historical resources than the APE for Alternative 1 and 39 fewer historical resources than the APE for Alternative 2. Therefore, potential impacts to built environment historic properties are significantly less under Alternative 3 than Alternatives 1 and 2.

The analysis related to potential noise, vibration, and visual operational impacts resulting from project features presented above is applicable to Alternative 3. A majority of the historical resources in the APE for Alternative 3 require no easements; a limited number of sliver acquisitions are necessary. However, these would be minimal and would not diminish the integrity of any of the historical resources in the APE.

One historical resource in the APE for Alternative 3 would be physically altered by its operation: I-105/Century Freeway-Transitway Historic District/21-027. This historical resource is also in the APE for Alternatives 1 and 2, and modifications to the Century Freeway-Transitway Historic District under Alternative 3 would be consistent with those previously described. Despite the alterations proposed to the I-105/Century Freeway-Transitway Historic District under Alternative 3, following implementation, the district would retain integrity of location, setting, design, materials, workmanship, feeling, and association, and impacts would be less than significant. No additional built environment historical resources in the APE for Alternative 3 would be directly altered physically by its operation.

Operation of Alternative 3 would result in less than significant impacts to historical resources, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

There are five built environment historical resources located in the APE for Alternative 4. As indicated in the Cultural Resources Effects Report (Appendix X) prepared for the Project, operation of Alternative 4 would result in less than significant impacts to built environment historical resources. The APE for Alternative 4 includes 32 fewer historical resources than the APE for Alternative 1, 51 fewer historic properties than the APE for Alternative 2, and 12 fewer historical resources than the APE for Alternative 3. Therefore, the potential for impacts to built environment historical resources is significantly less under Alternative 4.

The analysis related to potential noise, vibration, and visual operational impacts resulting from the project features presented above is applicable to Alternative 4. There are no historical resources in the APE for Alternative 4 that require permanent easements. One historical resource property in the APE for Alternative 4 would be directly altered physically by its operation: the I-105/Century Freeway-Transitway Historic District/21-027. This historic property is also in Alternatives 1, 2, and 3, and modifications to the Century Freeway-Transitway Historic District under Alternative 4 would be consistent with those previously described. Despite the alterations proposed to the I-105/Century Freeway-Transitway Historic District under Alternative 4, following implementation, the district would retain integrity of

location, setting, design, materials, workmanship, feeling, and association, and impacts would be less than significant. No additional built environment historical resources in the APE for Alternative 3 would be directly altered physically by its operation. Operation of Alternative 4 would result in less than significant impacts to historical resources, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD: The potential for impacts as a result of operation of Design Option 1 (MWD) and Alternative 1 are generally consistent, and there is not an increased potential for operational impacts to built environment historical resources resulting from Alternative 1 with Design Option 1 (MWD) when compared to Alternative 1 without Design Option 1 (MWD).

The analysis related to potential noise, vibration, and visual operational effects resulting from project features presented above is applicable to Design Option 1 (MWD). Additionally, operation of Design Option 1 (MWD) would require a permanent, partial underground easement below LAUS. However, the addition of the tunnel would not diminish the property's integrity because it would be located significantly below grade and would not result in a visual impact. Additionally, permanent above-grade ventilation grating would be added to LAUS under Design Option 1 (MWD). However, ventilation grating installed on the historic property would be flush with the existing paved surfaces and would not detract from or significantly alter the already urban environment.

Project operations would not change the use or alter the historic characteristics of any extant built environment historical resources in the APE, including LAUS, in a manner that would diminish their integrity of location, design, setting, materials, workmanship, feeling, or association. Existing built environment historical resources would continue to convey their significance.

Operation of Design Option 1 (MWD)would result in a less than significant impact to built environment historical resources, and mitigation would not be required.

Design Option 2: Add Little Tokyo Station: The potential for impacts as a result of operation of Design Option 2 and Alternative 1 are generally consistent, and there is not an increased potential for impacts to built environment historical resources resulting from operation of Alternative 1 with Design Option 2 when compared to Alternative 1 without Design Option 2.

The analysis related to potential noise, vibration, and visual operational impacts resulting from project features presented above is applicable to Design Option 2. There are no easements of historical resources necessary under Design Option 2. No built environment historical resources are in the immediate vicinity of Little Tokyo Station, which would be constructed below grade under Design Option 2. 216 South Alameda Street/MRN 2-003 is approximately 140 feet from the Little Tokyo Station southern underground station access. The station entrance would be visually blocked from the historical resource by MRN 2-002. It would also be physically separated from that proposed station entrance by MRN 2-002, in addition to East 2nd Street. Operation of Design Option 2 would therefore result in no impact to built environment historical resources, and mitigation would not be required. Operation of Design Option 2 would result in no impact to built environment historical resources, and mitigation would not be required.

Maintenance and Storage Facility

Paramount MSF Site Option: The analysis related to potential noise, vibration, and visual operational impacts resulting from project features presented above is applicable to the Paramount MSF site option. Permanent acquisitions and/or easements may be required for operation of the Paramount MSF site option. However, no permanent acquisitions and/or easements of built environment historical resources are proposed. No built environment historical resources are in the direct project footprint associated with the Paramount MSF site option. However, the proposed Paramount MSF is located directly to the west (rear) of one historical resource (Our Lady of the Rosary Church/MRN 24-001). The resource's eligibility is related to its architecture, which would not be altered by operation of the Paramount MSF site option. While it would introduce new visual elements to the vicinity of this historic property, new elements would not significantly alter the visual character and quality of the area, which may be characterized as urban, or reduce the property's integrity. Operation of the Paramount MSF would result in a less than significant impact to historical resources, and mitigation would not be required.

Bellflower MSF Site Option: The analysis related to potential noise, vibration, and visual operational impacts resulting from project features presented above is applicable to the Bellflower MSF site option. Permanent acquisitions and/or easements may be required for operation of the Bellflower MSF site option. However, no permanent acquisitions and/or easements of built environment historical resources are proposed. No built environment historical resources are located in the vicinity of the proposed Bellflower MSF site option. The closest historical resource proper is Our Lady of the Rosary Church/MRN 24-001, located approximately 1-mile northwest of the Bellflower MSF site option. Operation of the Bellflower MSF would result in no impact to built environment historical resources, and mitigation would not be required.

When comparing the potential impacts to built environment historical resources associated with operation of the Paramount and Bellflower MSF site options, operation of the Paramount MSF has a greater potential for effects due to the presence of one as opposed to zero historical resources in its vicinity.

4.14.5.2 Archaeological Resources

Would the Project cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5?

No Project Alternative

Under the No Project Alternative, the Project would not be constructed, and no new infrastructure would be built within the direct APE. No ground disturbance would occur under the No Project Alternative. Therefore, no impact to known or unanticipated archaeological resources would occur as a result of the No Project Alternative, and mitigation would not be required.

Build Alternatives

Under Alternatives 1, 2, 3, and 4, potential physical impacts related to operation of the Project would be negligible because there would be minimal, if any, ground disturbance associated with the ongoing maintenance and operation of the Project under these alternatives. Other impacts such as noise, vibration, and visual associated with the ongoing maintenance and operation of the Project are not expected to affect archaeological

resources. Therefore, there would be no impact to archaeological resources as a result of operation of Alternatives 1, 2, 3, and 4, and mitigation would not be required.

The potential for impacts to archaeological historical resources is greatest under Alternative 1 due to its length and number of archaeological historical resources present within its APE. The potential for impacts to archaeological historical resource is less under Alternatives 2 and 3 (both have one known archaeological historical resource in their APE) than under Alternative 1 and is least under Alternative 4 (the shortest alternative with no known archaeological historical resources in its APE).

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: There would be minimal, if any, ground disturbance as a result of operation of Design Options 1 and 2. Therefore, no impacts would occur, and mitigation would not be required. The potential for impacts to archaeological historical resources is consistent between Alternative 1 without Design Option 1 and/or 2 and Alternative 1 with Design Option 1 and/or 2.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: No ground-disturbing activities are proposed at the Paramount or Bellflower MSF site options during the operation phase of the Project. Therefore, there would be no impact to archaeological resources during operation of either MSF, and mitigation would not be required. The potential for impacts to archaeological historical resources is consistent among the Paramount and Bellflower MSF site options.

Would the Project disturb any human remains, including those interred outside of dedicated cemeteries?

No Project Alternative

Under the No Project Alternative, the Project would not be constructed, and no new infrastructure would be built within the direct APE. No ground disturbance would occur under the No Project Alternative. Therefore, no impact to human remains would occur as a result of the No Project Alternative. and mitigation would not be required.

Build Alternatives

Under Alternatives 1, 2, 3, and 4, potential physical impacts related to operation of the Project would be negligible because there would be minimal, if any, ground disturbance associated with the ongoing maintenance and operation of the Project under these alternatives. Other impacts such as noise, vibration, and visual associated with the ongoing maintenance and operation of the Project are not expected to impact interred human remains. Therefore, there would be no impact to human remains as a result of operation of Alternatives 1, 2, 3, and 4, and mitigation would not be required.

The potential for impacts to human remains is greatest under Alternative 1 due to its length. The potential for impacts to human remains is less under Alternatives 2 and 3 than under Alternative 1 and is least under Alternative 4, which has the shortest alignment.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: There would be minimal, if any, ground disturbance as a result of operation of Design Options 1 and 2.

Therefore, no impact to human remains would occur, and mitigation would not be required. The potential for impacts to human remains is consistent between Alternative 1 without Design Options 1 and/or 2 and Alternative 1 with Design Options 1 and/or 2.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: No ground-disturbing activities are proposed at the Paramount or Bellflower MSF site options during operation of the Project. Therefore, there would be no impact to human remains during operation of either MSF, and mitigation would not be required. The potential for impacts to human remains is consistent between the Paramount and Bellflower MSF site options.

4.14.5.3 Paleontological Resources

Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would not be constructed and the environmental setting would remain in current conditions. Therefore, no impact to paleontological resources would result, and mitigation would not be required.

Build Alternatives

Direct impacts to paleontological resources due to ongoing maintenance and operation under Alternatives 1, 2, 3, and 4 would be negligible because there would be minimal, if any, ground disturbance during operation of the Project under these alternatives. Therefore, the Build Alternatives would result in no impact to paleontological resources, and mitigation would not be required.

As the entire Affected Area for paleontological resources is considered to have the same paleontological sensitivity (high at depths at or below 5 feet), potential impacts to paleontological resources associated with project operation is consistent among Alternatives 1, 2, 3, and 4. However, as Alternatives 1 and 2 are significantly longer than Alternatives 3, and 4, the potential for impacts is greater under these alternatives. Given its length, the potential for impacts to paleontological resources as a result of project operation is least under Alternative 4.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Direct impacts to paleontological resources due to ongoing maintenance and operation of Design Options 1 and 2 would be negligible because there would be minimal, if any, ground disturbance during operation of either design option. Therefore, operation of Design Options 1 and 2 would result in no impacts to paleontological resources, and mitigation would not be required. As noted above, the entire Affected Area for paleontological resources is considered to have a consistent paleontological sensitivity (high at depths at or below 5 feet). Therefore, potential impacts to paleontological resources associated with operation of Design Options 1 and 2 are consistent with one another and do not present increased potential for impacts when compared to Alternative 1 without Design Options 1 or 2.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: No ground-disturbing activities are proposed at the MSF site options during operation of the Project. Therefore, there would be no impacts to paleontological resources during operation of either MSF and mitigation would not be required. The potential for impacts to paleontological resources is consistent between the Paramount and Bellflower MSF site options.

4.15 Tribal Cultural Resources

This section summarizes the consultation conducted in compliance with Section 106 of the NHPA and the Native American notification and consultation efforts performed for compliance with AB 52. AB 52 consultation efforts resulted in the identification of one Tribal Cultural Resource (TCR) and the Section 106 consultation identified no known or potential Native American Traditional Cultural Properties (TCP) in the Affected Area. The potential adverse effects and significant impacts on TCP and TCRs were analyzed under existing conditions and the No Build Alternative, and from construction and operation of the four Build Alternatives, including design options and MSF site options.

For the purposes of this analysis, the Affected Area for tribal cultural resources corresponds to the direct APE established for the Project, with which the SHPO concurred on May 29, 2019 (see Section 4.14, Historic, Archaeological, and Paleontological Resources). Information in this section is based on the *West Santa Ana Branch Transit Corridor Project Final Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report* (Metro 2021b), included as Appendix Z to this Draft EIS/EIR.

4.15.1 Regulatory Setting and Methodology

4.15.1.1 Regulatory Setting

Federal

Federal protection for Native American resources applies to projects if any construction or other related project impacts occur on federally owned or managed lands, involve the crossing of state lines, or are federally funded. The following federal protections may apply to Native American cultural resources in the Affected Area for tribal cultural resources:

- NEPA, as amended (P.L. 91-190, 42 U.S.C. 4321- 4347, January 1, 1970, as amended by P.L. 94-52, July 3, 1975; P.L. 94-83, August 9, 1975; and P.L. 97-258 Section 4(b), September 13, 1982). NEPA recognizes the continuing responsibility of the federal government to "preserve important historic, cultural, and natural aspects of our national heritage" (Section 101 [42 U.S.C. Section 4321], No. 382).
- NHPA of 1966 (16 U.S.C. 470 et seq.) is the cornerstone of the current federal cultural resources preservation program. NHPA proclaims that the historical and cultural foundations of the nation should be preserved as a living part of our community life in order to give a sense of orientation to the American people. NHPA expanded the policy enunciated by the Historic Sites Act to encompass resources meeting the NRHP criteria for state and local historical significance, in addition to national significance, thus providing the basis for an expanded NRHP maintained by the Secretary of the Interior. The main purpose of NHPA is to protect "historic properties," defined as any prehistoric or historic districts, sites, buildings, structures, or objects included or eligible for inclusion in the NRHP. Properties of traditional religious and cultural importance to Native Americans are also considered under

Section 101 (d)(6)(A) of the NHPA, and Section 106 36 CFR 800.3-800.10. To be determined eligible for the NRHP, properties must be significant in American history, architecture, archaeology, engineering, or culture, and generally must be at least 50 years old. Historic properties may also include TCPs, which consist of physical properties or places (e.g., district, site, building, structure, or object) that are significant because of their association with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community (Parker and King 1998). All historic properties must also possess integrity of location, design, setting, materials, workmanship, feeling, or association, and meet at least one of the following criteria set forth in the NRHP regulations (36 CFR Part 60):

A) Are associated with events that have made a significant contribution to the broad patterns of our history
B) Are associated with the lives of persons significant in our past
C) Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
D) Have yielded, or may be likely to yield, information important in prehistory or history

State

AB 52 and CEQA are relevant state regulations that are applicable to Native American cultural resources in the Affected Area for tribal cultural resources. With the enactment of AB 52, the 1970 CEQA (PRC Section 5024) was expanded to include TCRs as a new resource category. AB 52 establishes that "a project with an effect that may cause a substantial adverse change in the significance of a TCR is a project that may have a significant effect on the environment" (PRC Section 21084.2). It further states that the lead agency shall establish measures to avoid impacts that would alter the significant characteristics of a TCR, when feasible (PRC Section 21084.3). PRC Section 21074 (a)(1)(A) and (B) defines TCRs as "sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe," and meets either of the following criteria:

a. Listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k)
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe

In recognition of California Native American tribal sovereignty and the unique relationship of California local governments and public agencies with California Native American tribal governments and with respect to the interests and roles of project proponents, it is the intent of AB 52 to accomplish all of the following:

(1) Recognize that California Native American prehistoric, historic, archaeological, cultural, and sacred places are essential elements in tribal cultural traditions, heritages, and identities

(2) Establish a new category of resources in CEQA called "Tribal Cultural Resources" or TCRs that considers the tribal cultural values in addition to the scientific and archaeological values when determining impacts and mitigation
(3) Establish examples of mitigation measures for TCRs that uphold the existing mitigation preference for historical and archaeological resources of preservation in place, if feasible
(4) Recognize that California Native American tribes may have expertise with regard to their tribal history and practices, which concern the TCRs with which they are traditionally and culturally affiliated (Because CEQA calls for a sufficient degree of analysis, tribal knowledge about the land and TCRs at issue should be included in environmental assessments for projects that may have a significant impact on those resources)
(5) In recognition of their governmental status, establish a meaningful consultation process between California Native American tribal governments and lead agencies, respecting the interests and roles of all California Native American tribes and project proponents, and the level of required confidentiality concerning TCRs, early in the CEQA environmental review process, so that TCRs can be identified, and culturally appropriate mitigation and mitigation monitoring programs can be considered by the decision-making body of the lead agency
(6) Recognize the unique history of California Native American tribes and uphold existing rights of all California Native American tribes to participate in, and contribute their knowledge to, the environmental review process pursuant to CEQA
(7) Ensure that local and tribal governments, public agencies, and project proponents have information available, early in CEQA environmental review process, for purposes of identifying and addressing potential adverse impacts to TCRs and to reduce the potential for delay and conflicts in the environmental review process
(8) Enable California Native American tribes to manage and accept conveyances of, and act as caretakers of, TCRs
(9) Establish that a substantial adverse change to a TCR has a significant effect on the environment

AB 52 also establishes a formal consultation process for California tribes regarding those resources. The consultation process must be completed before a CEQA document can be certified. AB 52 requires that lead agencies "begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project." Native American tribes to be included in the process are those that have requested notice of projects proposed in the jurisdiction of the lead agency.

4.15.1.2 Methodology

South Central Coastal Information Center Record Search

A California Historical Resources Information System search was conducted for the Project Corridor on April 17, 2017, at the South Central Coastal Information Center (SCCIC), California State University, Fullerton. Following changes to the project alignment in 2018, a supplemental records search was conducted on August 28, 2018. The searches were performed to identify previously conducted cultural resource studies and previously recorded cultural resources within a 0.5-mile radius of the project alignment. Resulting from a request received through the Native American consultation performed for this Project (summarized below), an additional records search was conducted in December 2019 to expand the records search radius from 0.5 to 1 mile. The searches included a review of the NRHP, the State Historic Property Data Files, California Historical Landmarks, California Points of Historic

Interest, California Office of Historic Preservation Archaeological Determinations of Eligibility, and the California Department of Transportation State and Local Bridge Surveys in addition to available historic U.S. Geological Survey 7.5- and 15-minute quadrangle maps.

Native American Heritage Commission Sacred Lands File Search

Native American consultation was initiated for this Project on June 23, 2017. As part of the process of identifying cultural resources within or near the APE, Rincon contacted the Native American Heritage Commission (NAHC) via email and requested a review of the Sacred Lands File (SLF). Rincon was emailed the results from the NAHC on July 27, 2017. Following changes to the project alignment, Rincon emailed a supplemental SLF request to the NAHC on August 30, 2018, with a response received from the second search on September 11, 2018. Responses received from the NAHC are included in Appendix A of the Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report prepared for the Project.

Both SLF searches resulted in positive results with the NAHC noting that sites have been located within the Los Angeles quadrangle of the APE that may be impacted by the Project. The NAHC recommended that the Gabrieleño Band of Mission Indians – Kizh Nation be contacted to obtain additional information regarding these sites. The NAHC also provided lists of groups or individuals who may have additional information regarding cultural resources that may exist within the APE; these groups are as follows:

- Anthony Morales, Chairperson, Gabrieleño/Tongva San Gabriel Band of Mission Indians
- Andrew Salas, Chairperson, Gabrieleño Band of Mission Indians – Kizh Nation
- Sandonne Goad, Chairperson, Gabrieliño/Tongva Nation
- Robert Dorame, Chairperson, Gabrieliño-Tongva Indians of California Tribal Council
- Charles Alvarez, Gabrieliño-Tongva Tribe
- Linda Candelaria, Chairperson, Gabrieliño-Tongva Tribe
- Matias Belardes, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation – Belardes
- Joyce Perry, Tribal Manager, Juaneño Band of Mission Indians Acjachemen Nation – Belardes

All correspondence associated with the Native American consultation efforts are included in Appendix A of the Final Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report.

Assembly Bill 52 Consultation

Metro obtained a tribal consultation list for Los Angeles County from the NAHC on July 25, 2017. The list included the following contacts:

- Andrew Salas, Chairperson, Gabrieleño Band of Mission Indians – Kizh Nation
- Anthony Morales, Chairperson, Gabrieleño/Tongva San Gabriel Band of Mission Indians
- Sandonne Goad, Chairperson, Gabrieliño/Tongva Nation
- Robert Dorame, Chairperson, Gabrieliño-Tongva Indians of California Tribal Council
- Charles Alvarez, Gabrieliño-Tongva Tribe
- Matias Belardes, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation – Belardes

The two contact lists provided by the NAHC as part of the SLF searches on July 27, 2017, and September 11, 2018, included the following additional individuals not on the AB 52 list:

- Linda Candelaria, Gabrieliño-Tongva Tribe
- Joyce Perry, Juaneño Band of Mission Indians

Pursuant to the requirements of AB 52, on October 16, 2018, Metro, acting as the lead CEQA agency, sent project notification letters to all eight of the above-listed Native American contacts (inclusive of those two not on the Los Angeles County consultation list but included on the list provided by the NAHC as part of the SLF search). The letters provided a description of the Project, the project location, and the lead agency contact information.

Metro received no requests for AB 52 consultation from seven of the eight Native American groups that were contacted via mail. In an email dated November 14, 2018, the Gabrieleño Band of Mission Indians – Kizh Nation (Kizh Nation) stated that if any ground disturbance was to occur for the Project, their tribal government would like to be consulted. The Kizh Nation also sent a letter to Metro personnel dated November 30, 2018, formally requesting AB 52 consultation for the Project. A summary of the consultation that occurred between Metro and the Kizh Nation is included below and is documented in Appendix B, Section 2 of the Final Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report. No specific TCRs were identified during the consultation effort described below. However, it is assumed that P-19-1575 (CA-LAN-1575/H), located near LAUS in Alternative 1, is a TCR for the purposes of this Project, as it contains a Native American cemetery and is listed in the CRHR.

Metro initiated AB 52 consultation with the Kizh Nation via teleconference on November 16, 2018. During the meeting, Kizh Nation representatives discussed TCRs located within the vicinity of the project alignment. Following the teleconference, the Kizh Nation sent a follow-up email to Metro that included a historic map showing the general locations of some of the TCRs overlaid against a Google Earth map.

Metro and the Kizh Nation participated in a second teleconference meeting to discuss more specific information about TCRs along the alignment on January 24, 2019. During the meeting, Kizh Nation representatives (Andrew Salas and Matthew Teutimez) stated the area is culturally sensitive and noted that some of the project corridor follows or intersects major Native American trade routes. Tribal representatives referred to the Kirkman-Harriman Map (Kirkman 1937), which depicts the approximate location of these trade routes. Mr. Salas noted that human remains may be located along these trails. Because of the ancestral trade routes found in this area, the tribe considers the project corridor to be part of a cultural landscape. Given the length of the project corridor, Metro requested that the Kizh Nation provide more specific information on those portions of the alignment that they consider to be particularly sensitive for TCRs. Metro also requested a copy of any mitigation language the tribe would like to provide to reduce project impacts.

Metro sent a follow-up email to the Kizh Nation on March 11, 2019, requesting that the tribe provide additional maps or mitigation language to be included in the environmental document. In this correspondence, Metro requested a response from the tribe by March 13, 2019. Metro also made follow-up calls to the Kizh Nation and left voicemail messages. No response was received from these outreach efforts.

On April 15, 2019, Metro sent a letter to the tribe again requesting additional maps and mitigation language. The letter stated that this information should be provided to Metro by

May 16, 2019, to continue the AB 52 consultation process. The Kizh Nation emailed Metro with proposed mitigation language on April 22, 2019.

On July 19, 2019, Metro sent a letter to the tribe that summarized the project mitigation measures that were developed, taking into consideration the various aspects of the Kizh Nation's proposed mitigation measures that relate to TCRs. On August 8, 2019, the Kizh Nation replied via email that they had reviewed the proposed mitigation measures outlined in the letter sent July 19, 2019, and that the Kizh Nation concurred with the proposed measures and that the consultation process for the Project was formally concluded.

All of the information summarized above in relation to AB 52 consultation is included in Appendix B of the Final Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report.

Section 106 Consultation

On December 21, 2018, the FTA sent Section 106 consultation letters to the following Native American contacts:

- Andrew Salas, Chairperson, Kizh Nation
- Anthony Morales, Chairperson, Gabrieleño/Tongva San Gabriel Band of Mission Indians
- Sandonne Goad, Chairperson, Gabrieliño/Tongva Nation
- Robert Dorame, Chairperson, Gabrieliño-Tongva Indians of California Tribal Council
- Charles Alvarez, Councilmember, Gabrieliño-Tongva
- Linda Candelaria, Chairperson, Gabrieleño/Tongva Tribe
- Matias Belardes, Chairperson, Juaneño Band of Mission Indians Acjachemen Nation – Belardes
- Joyce Perry, Juaneño Band of Mission Indians

The letter invited the Native American groups to participate in the Section 106 consultation process and included information on the identification of prehistoric sites, and sacred and/or TCPs in the APE. The FTA requested that the tribes review the information contained in the letter and provide any additional information or comments they may have within 30 days of receiving the letter. Follow-up phone calls were conducted on January 29, 2019, for all contacts with phone numbers on file at the NAHC.

Responses were received from the Kizh Nation, Adrian Morales of the Gabrieleño/Tongva San Gabriel Band of Mission Indians, and Robert Dorame, Chairperson for the Gabrieleño Tongva Indians of California Tribal Council.

- On January 3, 2019, the Kizh Nation sent an email to the FTA requesting Section 106 consultation for the Project. On behalf of FTA, on March 11 and 12, 2020, telephone calls were placed, and an email sent to follow up on this request. Following telephone and email correspondence, on March 13, 2020, Andrew Salas, Chairperson for the Kizh Nation, agreed in an email that the mitigation developed for the purposes of AB 52 would be acceptable for the purposes of Section 106. Consultation between the Kizh Nation and FTA was thus concluded.
- On February 11, 2019, Adrian Morales of the Gabrieleño/Tongva San Gabriel Band of Mission Indians emailed a response also requesting Section 106 consultation. Mr. Morales requested that the SCCIC record searches and all other informational data

source be inclusive of a 1.0-mile radius search. In response to this request, the SCCIC record search was updated to 1.0-mile accordingly.

- Robert Dorame, Chairperson for the Gabrieleño Tongva Indians of California Tribal Council, discussed the Project with FTA staff on January 29, 2019. At that time, he stated he would respond to the request by email. Despite email follow up by FTA, further response was not received, and consultation between the Gabrieleño Tongva Indians of California and FTA was concluded.

The Section 106 consultation summarized above resulted in the identification of zero TCPs. Details of the Section 106 consultation summarized above is included in Appendix C of the Final Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report.

4.15.2 Affected Environment/Existing Conditions

The following is a discussion of the affected environment based on general corridor-wide conditions.

4.15.2.1 Ethnographic Setting

The Affected Area for tribal cultural resources is in the traditional territory of the Native American group known as the Tongva, Gabrieliño, or Kizh. The Tongva territory included a large area in and around Los Angeles County, as well as the southern Channel Islands and coastlines from Aliso Creek in the south to Topanga Creek in the north. The Tongva territory was bordered by several different Native American groups, including the Serrano to the north and northeast, the Tataviam to the north, the Chumash to the northwest, the Cahuilla to the east, and the Luiseño and Juaneño to the south and southeast.

The Tongva language belongs to the Takic branch of the Uto-Aztecan language family. Tongva society was organized along patrilineal non-localized clans, a common Takic pattern. Each clan had a ceremonial leader and contained several lineages. The Tongva established permanent villages and smaller satellite camps throughout their territory. Tongva subsistence was oriented around acorns supplemented by the roots, leaves, seeds, and fruits of a wide variety of plants and animals. The Tongva lived in circular domed structures made up of thatched tule covering a frame of wooden poles usually of willow.

4.15.2.2 SCCIC Record Search Results

The SCCIC record search identified nine prehistoric sites or sites with prehistoric components within one mile of the APE; of those, two, described below, are within the direct APE. Located in Alternative 1, much of P-19-001575 lies underneath extant buildings associated with Union Station and was originally recorded as a historic archaeological site consisting of artifacts, architectural remains, and other cultural features associated with the nineteenth and twentieth century Chinatown. Subsequent investigations at the site resulted in the discovery and documentation of a Native American cemetery consisting of 14 interments and 5 cremations (Goldberg et al., 1999). As part of the Link Union Station Project (Metro 2019c), P-19-001575 was determined eligible with SHPO concurrence for listing on the NRHP under Criterion D and the CRHR under Criterion 4. P-19-003889 has been previously recommended ineligible for listing on the CRHR (Game et al., 2007); for the purposes of this study, the site is assumed to be ineligible for listing on the NRHP.

P-19-003889 is a multicomponent site lying east of Long Beach Avenue in both Alternatives 1 and 2. The site is primarily composed of a historic refuse scatter dating to the early twentieth century. The prehistoric component of the site contains a single chert core. Two basalt pestles were identified at the site, but they appear to represent modern tejolotes. Phase II

testing at the site by Game et al. (2007) found that P-19-003889 is a highly disturbed surface scatter with little evidence of subsurface deposits or features. Based on these findings, Game et al. (2007) recommended the site as ineligible for listing on the CRHR. For the purposes of this analysis, the site is assumed to be ineligible for listing on the NRHP.

4.15.2.3 NAHC SLF Search Results

Searches of the SLF by the NAHC indicate that Native American sites are located in the Study Area. The NAHC requested that the Kizh Nation be contacted to obtain additional information regarding these sites. Documents related to the SLF searches and NAHC responses are included in Appendix A of the Traditional Cultural Properties and Tribal Cultural Resources Impact Analysis Report.

4.15.2.4 AB 52 Consultation Results

As part of the AB 52 consultation process, the Kizh Nation provided information on Native American cultural resources located within the Affected Area for tribal cultural resources. No specific TCRs were identified during these consultation efforts. However, it is assumed that P-19-1575 (CA-LAN-1575/H), located near LAUS in the Northern Section (Alternative 1), is a TCR for the purposes of this Project as it contains a Native American cemetery and is eligible for listing on the CRHR.

As previously discussed in Section 4.15.1.2, tribal representatives indicated that historic maps depict several trade routes that intersect or appear to be located in the vicinity of the Affected Area for tribal cultural resources. No archaeological evidence of these trade routes has been documented within the project corridor and the precise location of these routes is unknown. Tribal representatives note that there is a potential to encounter human remains in these areas adjacent to the reported trade routes. They also indicated the presence of waterways and bodies of water that were high attractants to prehistoric Native American groups residing in the area. Because of their use by Native Americans, these areas have a higher-than-average potential for encountering unanticipated TCRs (i.e., Native American artifacts and human remains) during ground-disturbing activities.

4.15.2.5 Section 106 Consultation Results

The Section 106 consultation performed for this study did not identify any known or potential Native American TCPs. The results of the Section 106 consultation, as they pertain to identified and potential locations of archaeological sites are discussed in the *West Santa Ana Branch Transit Corridor Project Final Cultural Resources Survey Report – Rev 1* (Metro 2020d), attached as Appendix W to this Draft EIS/EIR, and the *West Santa Ana Branch Transit Corridor Project Revised Preliminary Cultural Resources Effects Report* (Metro 2021u), attached as Appendix X to this Draft EIS/EIR.

4.15.3 Environmental Consequences/Environmental Impacts

4.15.3.1 No Build Alternative

Under the No Build Alternative, no new infrastructure would be built within the Affected Area for tribal cultural resources with the exception of the following: projects currently under construction, projects funded for construction, environmentally cleared, planned to be in operation by 2042, and identified in the constrained Metro 2009 LRTP (Metro 2009a) and the SCAG 2016-2040 RTP/SCS (SCAG 2016a), as well as additional projects funded by Measure M.

Under the No Build Alternative, the environmental setting would remain in its current condition and no ground disturbance would occur. No physical alteration of known or unanticipated TCPs would take place under the No Built Alternative. The No Build Alterative would result no effects to known or unanticipated TCPs.

4.15.3.2 Alternative 1: Los Angeles Union Station to Pioneer Station

No TCPs have been identified in Alternative 1. Therefore, the operation of Alternative 1 would result in no effects to known TCPs. Additionally, the operation of Alternative 1 would result in no direct effects to unknown TCPs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect effects (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 1 are not expected to affect subsurface archaeological resources, including unanticipated TCPs. Under NEPA, the operation of Alternative 1 would result in no effects to known or unanticipated TCPs.

4.15.3.3 Alternative 2: 7th Street/Metro Center to Pioneer Station

No TCPs have been identified in Alternative 2. Therefore, the operation of Alternative 2 would result in no effects to known TCPs. Additionally, the operation of Alternative 2, would result in no direct effects to unknown TCPs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect effects (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 2 are not expected to affect subsurface archaeological resources, including unanticipated TCPs. Due to consistency in project design and existing environmental conditions related to TCPs, the potential for effects to TCPs is consistent between Alternatives 1 and 2. Under NEPA, the operation of Alternative 2 would result in no effects to known or unanticipated TCPs.

4.15.3.4 Alternative 3: Slauson/A (Blue) Line to Pioneer Station

No TCPs have been identified in Alternative 3. Therefore, the operation of Alternative 3 would result in no effects to known TCPs. Additionally, the operation of Alternative 3 would result in no direct effects to unknown TCPs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect effects (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 3 are not expected to affect subsurface archaeological resources, including unanticipated TCPs. Under NEPA, the operation of Alternative 3 would result in no effects to known or unanticipated TCPs. The potential for effects to TCPs resulting from operation of Alternative 3 is less than Alternatives 1 and 2 due to this alternative's significantly reduced length.

4.15.3.5 Alternative 4: I-105/C (Green) Line to Pioneer Station

No TCPs have been identified in Alternative 4. Therefore, the operation of Alternative 4 would result in no effects to known TCPs. Additionally, the operation of Alternative 4 would result in no direct effects to unknown TCPs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect effects (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 4 are not expected to affect subsurface archaeological resources, including unanticipated TCPs. Under NEPA, the operation of Alternative 4 would result in no effects to known or unanticipated TCPs. The potential for effects to TCPs resulting from operation of Alternative 4 is least among the Build Alternatives due to its reduced length.

4.15.3.6 Design Options—Alternative 1

Design Option 1: LAUS at MWD

No TCPs have been identified in the APE associated with Design Option 1 (MWD), which would relocate the LAUS Terminus Station east of the MWD building. The operation of Design Option 1 (MWD) would therefore result in no effects to known TCPs. Similar to Alternatives 1 through 4, direct and indirect effects to unanticipated TCPs due to ongoing maintenance and operations associated with Design Option 1 (MWD) would be negligible because minimal, if any, ground disturbance would occur. Under NEPA, operation of Design Option 1 (MWD) would result in no effects to known or unanticipated TCPs. The potential for effects to TCPs is consistent between Alternative 1 with and without Design Option 1 (MWD).

Design Option 2: Add Little Tokyo Station

No TCPs have been identified in Design Option 2, which would construct the Little Tokyo Station. Therefore, the operation of Design Option 2 would result in no effects to known TCPs. Similar to Alternatives 1 through 4, direct and indirect effects to unanticipated TCPs due to ongoing maintenance and operations associated with Design Option 2 would be negligible because minimal, if any, ground disturbance would occur. Under NEPA, operation of Design Option 2 would result in no effects to known or unanticipated TCPs. The potential for effects to TCPs is consistent between Alternative 1 with and without Design Option 2.

4.15.3.7 Maintenance and Storage Facility

Paramount MSF Site Option

No TCPs have been identified in the APE associated with the Paramount MSF site option. Therefore, the operation of the Paramount MSF site option would result in no effects to known TCPs. No ground-disturbing activities are proposed at the Paramount MSF site option during the operation phase of the Project. As a result, there would be no direct or indirect effects to known or unanticipated TCPs resulting from operation of the Paramount MSF site option.

Bellflower MSF Site Option

No TCPs have been identified in the APE associated with the Bellflower MSF site option. Therefore, the operation of the Bellflower MSF site option would result in no effects to known TCPs. No ground-disturbing activities are proposed at the Bellflower MSF site option during the operation phase of the Project. As a result, there would be no direct or indirect effects to known or unanticipated TCPs resulting from operation of the Bellflower MSF site option. The potential for effects to TCPs is consistent between the Paramount and the Bellflower MSF site options.

4.15.4 Project Measures and Mitigation Measures

Operation of Alternatives 1, 2, 3, and 4; Design Options 1 and 2; and the Paramount and Bellflower MSF site options would result in no direct or indirect effects to known or unanticipated TCPs and no project or mitigation measures are required.

4.15.5 California Environmental Quality Act Determination

4.15.5.1 Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subsection (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

No Project Alternative

Under the No Project Alternative, no new infrastructure would be built within the Affected Area for tribal cultural resources. The environmental setting would remain in its current condition and no ground disturbance would occur. No physical alteration of known or unanticipated TCRs would take place. The No Project Alterative would result no impacts to known or unanticipated TCRs, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

One presumed TCR has been identified in Alternative 1 (P-19-001575). The operation of Alternative 1, would result in no direct impacts to known or unknown TCRs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Additionally, indirect impacts (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 1 are not expected to impact subsurface archaeological resources, including unanticipated TCRs. The operation of Alternative 1 would result in no impacts to known or unanticipated TCRs, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

No TCRs have been identified in Alternative 2. Therefore, the operation of Alternative 2 would result in no impacts to known TCRs. The operation of Alternative 2 would result in no direct impacts to unknown TCRs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect effects (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 2 are not expected to impact subsurface archaeological resources, including unanticipated TCRs. The operation of Alternative 2 would result in no impacts to known or unanticipated TCRs, and mitigation would not be required. The potential for impacts to known TCRs is less under Alternative 2 than Alternative 1 due to the presence of one as opposed to zero TCRs. The potential for effects to unanticipated TCRs is consistent between Alternatives 1 and 2.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

No TCRs have been identified in Alternative 3. Therefore, the operation of Alternative 3 would result in no impacts to known TCRs. The operation of Alternative 3 would additionally result in no direct impacts to unknown TCRs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect

impacts (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 3 are not expected to impact subsurface archaeological resources, including unanticipated TCRs. The operation of Alternative 3 would result in no impacts to known or unanticipated TCRs, and mitigation would not be required. Consistent with Alternative 2, the potential for impacts to known TCRs is less under Alternative 3 than Alternative 1 due to the presence of one as opposed to zero TCRs. The potential for impacts to unanticipated TCRs is less under Alternative 3 when compared with Alternatives 1 and 2 due primarily to the reduced length of the alignment under this alternative.

Alternative 4: I-105/C (Green) Line to Pioneer Station

No TCRs have been identified in Alternative 4. Therefore, the operation of Alternative 4 would result in no impacts to known TCRs. The operation of Alternative 4 would additionally result in no direct impacts to unknown TCRs because there would be minimal, if any, ground disturbance associated with the Project's ongoing maintenance and operation under this Alternative. Indirect impacts (e.g., noise, vibration, or visual impacts) associated with the ongoing maintenance and operation of Alternative 4 are not expected to impact subsurface archaeological resources, including unanticipated TCRs. The operation of Alternative 4 would result in no impacts to known or unanticipated TCRs, and mitigation would not be required.

Consistent with Alternatives 2 and 3, the potential for impacts to known TCRs is less under Alternative 4 than Alternative 1 due to the presence of one as opposed to zero TCRs. The potential for impacts to unanticipated TCRs is less under Alternative 4 when compared with Alternatives 1, 2, and 3 due primarily to the reduced length of the alignment under this alternative.

Design Options—Alternative 1

Design Option 1: LAUS at MWD: One presumed TCR (P-19-001575) has been identified in Design Option 1 (MWD), which would relocate the LAUS Terminus Station east of the MWD building. Similar to Alternatives 1 through 4, direct and indirect impacts to known and unanticipated TCRs due to ongoing maintenance and operations associated with Design Option 1 (MWD) would be negligible because minimal, if any, ground disturbance would occur. Operation of Design Option 1 (MWD) would result in no effects to known or unanticipated TCRs, and mitigation would not be required. The potential for effects to TCRs is consistent between Alternative 1 with and without Design Option 1 (MWD).

Design Option 2: Add Little Tokyo Station: No TCRs have been identified in Design Option 2, which would construct the Little Tokyo Station. Therefore, the operation of Design Option 2 would result in no impacts to known TCRs. Similar to Alternatives 1 through 4, direct and indirect impacts to unanticipated TCRs due to ongoing maintenance and operations associated with Design Option 2 would be negligible because minimal, if any, ground disturbance would occur. Operation of Design Option 2 would result in no impacts to known or unanticipated TCRs, and mitigation would not be required. The potential for effects to TCRs is consistent between Alternative 1 with and without Design Option 2.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: No TCRs have been identified in the APE associated with the Paramount MSF or Bellflower MSF site options. Therefore, the operation of the MSF site options would result in no impacts to known TCRs. No ground-disturbing activities are proposed at the MSF site options during the operation phase of the Project. As a result, there would be no direct or indirect impacts to known or unanticipated

TCRs resulting from operation of the Paramount and Bellflower MSF site options, and mitigation would not be required. The potential for effects to TCRs is consistent between the Paramount and Bellflower MSF site options.

4.16 Parklands and Community Facilities

This section summarizes the potential adverse effects and impacts on parklands and community facilities for the No Build and Build Alternatives. Information in this section is based on the *West Santa Ana Branch Transit Corridor Project Final Parklands and Community Facilities Impact Analysis Report* (Metro 2021k), attached as Appendix AA to this Draft EIS/EIR. A detailed analysis of Section 4(f) of the U.S. Department of Transportation Act and Section 6(f) of the Land and Water Conservation Fund Act are discussed in the *West Santa Ana Branch Transit Corridor Project Section 4(f) and Section 6(f) Impact Analysis Report* (Metro 2021), attached as Appendix BB to this Draft EIS/EIR, and in Chapter 5 of this Draft EIS/EIR.

4.16.1 Regulatory Setting and Methodology

4.16.1.1 Regulatory Setting

Federal and state plans and policies applicable to parklands and community facilities include the U.S. Department of Transportation Act of 1966, Land and Water Conservation Fund Act of 1965, Uniform Fire Code, California Public Park Preservation Act of 1971, California Code of Regulations Title 24, and California Education Code. Local plans and policies applicable to parklands and community facilities include the general plans and community plans for the Cities of Los Angeles, Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Artesia, and Cerritos, and the unincorporated Florence-Firestone community of LA County.

The project alignment would extend through several jurisdictions with bicycle networks. The following adopted bicycle master plans have been identified in the affected jurisdictions: *County of Los Angeles Bicycle Master Plan 2012* (LA County 2012b), *City of Los Angeles 2010 Bicycle Plan* (City of Los Angeles 2011), *City of Huntington Park Bicycle Transportation Master Plan* (City of Huntington Park 2014), *City of South Gate Bicycle Transportation Plan* (City of South Gate 2012), *City of Bell Bicycle Master Plan* (City of Bell 2016), and the *Bellflower-Paramount Active Transportation Plan* (City of Bellflower and City of Paramount 2019).

4.16.1.2 Methodology

For the purposes of evaluating parklands and community facilities impacts, the Affected Area for parklands is defined as 0.25 mile on both sides of the proposed alignment and around the stations, parking facilities, MSF site options, and TPSS sites to identify the context of the surrounding area. The impact analysis for parklands and community facilities is focused on the parklands and community facilities located adjacent to (approximately 50 feet) the Build Alternatives as direct impacts are anticipated to affect these facilities; while indirect impacts could occur to facilities in the greater Affected Area.

For the NEPA analysis, potential adverse effects would occur if the Build Alternatives (including the design options) and MSF site options would result in direct or indirect impacts to parklands and community facilities. Direct impacts are defined as impacts involving physical acquisition, displacement, visual alteration, or relocation of parkland or a community facility. Indirect impacts are defined as changes to visual quality and pedestrian or vehicular access. Direct impacts to parklands and community facilities would only occur if such properties are located directly adjacent to or within the Build Alternatives facilities as these adjacent areas have been identified

to be the area of potential impact. Indirect impacts would most likely occur to facilities located in proximity to the Build Alternatives.

To satisfy CEQA requirements, impacts to parkland and recreation facilities are analyzed in accordance with Appendix G of the *CEQA Guidelines,* identified in Section 4.16.5.

4.16.2 Affected Environment/Existing Conditions

4.16.2.1 Parklands and Recreational Facilities

Within the Affected Area for parklands, 25 parkland and recreation facilities have been identified, totaling approximately 168 acres (Table 4.16.1). Specifically, there are 24 parklands and recreational facilities totaling approximately 165 acres identified under Alternative 1, 24 facilities totaling approximately 167 acres under Alternative 2, 19 facilities totaling 157 acres under Alternative 3, and 11 facilities totaling approximately 106 acres under Alternative 4. Each identified parkland is owned and managed by the local government jurisdictions. National parks, state parks, or wildlife refuges are not located in the Affected Area for parklands. In addition, five public schools that provide recreational resources that are open to the public are also identified.

Table 4.16.1. Parklands and Recreational Facilities Identified within 0.25-Mile of Build Alternatives

	Alternative	Facility	Total Size (acres)	Amenities	Distance to Build Alternatives[1]
Park and Recreational Facilities	**1**	**Los Angeles Plaza Park (Father Sierra Park)** 125 Paseo de la Plaza, Los Angeles	0.5	Open area with plaza	530 ft from (LAUS)
		Art District Dog Park 1004 E. 4th St, Los Angeles	<0.1	Dog park	1,160 ft
		Arts District Park 501 Hewitt St, Los Angeles	0.5	Children's play area, picnic area	780 ft
	2	**Grand Hope Park** 919 S. Grand Ave, Los Angeles	2.5	Urban park with playground and grass lawns amid mosaic-adorned clock tower	680 ft 920 ft from 7th Street/Metro Center Station
		6th & Gladys Street Park 808 E. 6th St, Los Angeles	0.3	Unstaffed park with picnic tables, half-court basketball, and outdoor exercise equipment	830 ft

	Alternative	Facility	Total Size (acres)	Amenities	Distance to Build Alternatives[1]
	1 and 2	**Fred Roberts Recreation Center** 4700 S. Honduras St, Los Angeles	2.5	Barbecue pits, basketball courts (lighted/outdoor), children play area, community room, picnic tables, volleyball courts (lighted), kitchen, outdoor fitness equipment, synthetic soccer field (unlighted), on-site parking	60 ft
		Ross Snyder Recreation Center 1501 E. 41st St, Los Angeles	6.7	Baseball diamond (lighted), basketball courts (lighted/indoor), basketball courts (lighted/outdoor), children play area, picnic tables, seasonal pool (outdoor/unheated), soccer field (lighted), synthetic field, tennis courts (lighted), two baseball diamonds (lighted), beach volleyball courts (unlighted), on-site parking	1,050 ft
	1, 2 and 3	**Slauson Multipurpose Center** 5306 S. Compton Ave, Los Angeles	3.6	Auditorium, baseball diamond (lighted), basketball courts (lighted/indoor), children play area, community room, computer lab, kitchen, multipurpose room, outdoor fitness equipment, stage, football field (lighted), on-site parking	730 ft
		Pueblo del Rio Recreation Center 5350 Alba St, Los Angeles	0.5	Children's play area	1,040 ft

	Alternative	Facility	Total Size (acres)	Amenities	Distance to Build Alternatives[1]
		Augustus F. Hawkins Natural Park 5790 Compton Ave, Los Angeles	8.5	Picnic tables, amphitheater, gardening boxes, walking paths, restroom(s), wetlands, nature museum hall, rental space, on-site parking	680 ft; 780 ft from Slauson/A Line Station
		Raul R. Perez Memorial Park 6208 Alameda St, Huntington Park	4.5	Community building, indoor fitness room, large room and kitchen, grass sports field (lighted), outdoor basketball courts (lighted), children's playground, walking trail, outdoor gym, on-site parking	200 ft
		Salt Lake Park 3401 E. Florence Ave, Huntington Park	23.0	Recreation center, gymnasium, grass soccer field, synthetic grass soccer field, baseball diamonds, batting cages, skate park, tennis courts, weight room, picnic areas, barbecues, children's playgrounds, concession stand, meetings rooms, on-site parking	70 ft; 480 ft from Florence/Salt Lake Station
		Lugo Park 7801 Otis Ave, Cudahy	4.4	Youth center, fitness center, gazebo with barbecues, tot-lot synthetic grass soccer field, on-site parking	200 ft
		Circle Park 10129 Garfield Ave, South Gate	4.0	Children playground, open grass area, baseball diamond, on-site parking	1,050 ft
	1, 2, 3, and 4	**Hollydale Community Center** 12221 Industrial Ave, South Gate	2.2	Basketball court, community center, playground	20 ft

	Alternative	Facility	Total Size (acres)	Amenities	Distance to Build Alternatives[1]
		Paramount Park 14400 Paramount Blvd, Paramount	21.9	Playgrounds, handball courts (lighted), baseball diamonds (lighted), basketball court (lighted), picnic shelters/barbecues, gymnasium, walking path, restrooms, pool, on-site parking	10 ft; 700 ft from Paramount/ Rosecrans Station; 720 ft from Paramount MSF site option
		Village Skate Park 7718 Somerset Blvd, Paramount	0.3	Skate park, lighted basketball court, picnic area, playground	510 ft from Paramount MSF site option
		Pirate Park 16559 Bellflower Blvd, Bellflower	<0.1	Pirate-themed children's playground, on-site parking	510 ft 790 ft from Bellflower Station
		Simms Park 16614 Clark Ave, Bellflower	12.6	Auditorium, multipurpose rooms, picnic shelter, lighted softball fields, basketball court, playground, barbeque braziers, fitness center and trail, on-site parking	970 ft
		Ruth R. Caruthers Park 10500 E. Flora Visa St, Bellflower	20.0	Baseball/softball fields (lighted), batting cages, skate park, game room, picnic areas, wading pool, playgrounds, lighted tennis courts, lighted basketball court, lighted volleyball courts, lighted handball courts, tetherball courts, fitness center, 2-mile fitness course, equestrian path, barbecues, 2.5-mile bike trail, on-site parking	50 ft
		Bellflower Skate Park 10500 E. Flora Visa St, Bellflower	0.2	Skate park, on-site parking	760 ft

	Alternative	Facility	Total Size (acres)	Amenities	Distance to Build Alternatives[1]
		Flora Vista Dog Park 9203 Flora Vista St, Bellflower	0.6	Dog park, on-site parking	Adjacent to Bellflower MSF site option
		Iron Wood Nine Golf Course 16449 Piuma Ave, Cerritos	26.6	Golf course and driving range, on-site parking	670 ft
		Rosewood Park 17715 Eric Ave, Cerritos	6.0	Basketball court, sand area with playground equipment, picnic shelters, barbecues, multipurpose field, on-site parking	60 ft
		Artesia Park 1870 Clarkdale Ave, Artesia	14.5	Banquet space, baseball/softball diamond, basketball court, meeting rooms, picnic areas, picnic shelters, children's playground, restrooms, soccer field, tennis court, on-site parking	270 ft 1,060 ft from Pioneer Station
School Facilities [2]	**1, 2, 3**	**Lillian Street Elementary School** 5909 Lillian St, Los Angeles	2.8	Playground, asphalt play areas include track, tennis court, four-square, basketball and other ball courts, and miscellaneous play space	90 ft
		San Antonio Elementary School 6222 State St, Huntington Park	2.2	Asphalt play areas include track, tennis court, basketball and other ball courts, and miscellaneous play space	120 ft
		Legacy High School Complex 5225 Tweedy Blvd, South Gate	7.3	Baseball field, open field, tennis courts	120 ft
	1, 2, 3 and 4	**Paramount High School** 14429 Downey Ave, Paramount	15.8	Baseball field, open field space, tennis courts, basketball courts, football field	60 ft

	Alternative	Facility	Total Size (acres)	Amenities	Distance to Build Alternatives[1]
		Paramount Park Elementary/ Middle School 14608 Paramount Blvd, Paramount	7.5	Playfield	100 ft

Source: Metro 2021k
Notes: ft = feet
[1] Distance is measured from the nearest point of the project alignment, station, or MSF to the recreational facility.
[2] Recreational facilities at the school facilities listed in the table are open for public use during non-school hours.

4.16.2.2 Bike Facilities

Using Caltrans' *Highway Design Manual* (2016c), bicycle facilities are classified as Class I, II, III, and IV. Class I bikeways provide a completely separated right-of-way for the exclusive use of bicycles and pedestrians. Class II bike lanes are typically striped lanes for one-way bike travel on a street or highway. Class III bike paths are signed shared roadways (sharrows) that provide shared use with pedestrians or motor vehicle traffic. Class IV bikeways are protected bike lanes that are physically separated from the vehicle travel lane by more than the white stripe. Separation may be accomplished with grade separation, flexible bollards, or permanent barriers. Table 4.16.2 summarizes the bike facilities identified within 0.25 mile of the Build Alternatives.

Table 4.16.2. Bike Facilities Identified within 0.25-Mile of Build Alternatives

Facility Name/Location	Total Length	On-site Parking	Location to Build Alternatives
City of LA Citywide Bikeway System Citywide Los Angeles	593 miles	No	Citywide with Class I, II, III, and IV bike lanes
Los Angeles River Bike Path Along Los Angeles River	20 miles	No	Class I; Crosses under the alignment at the Los Angeles River
Rio Hondo Bike Path City of South Gate	16.8 miles	No	Class I; Crosses under the alignment at the Rio Hondo
Paramount Bike Trail City of Paramount	2.3 miles	No	Class I; Parallels the alignment with segments within the LADWP utilities corridor and Metro-owned right-of-way from the Los Angeles River to Lakewood Blvd
Bellflower Bike Trail City of Bellflower	2.7 miles	No	Class I; Parallels the alignment within the Metro-owned right-of-way between Somerset Boulevard to just north of the SR-91 freeway
San Gabriel River Mid-Trail Along San Gabriel River	28 miles	No	Class I; Crosses under the alignment at the San Gabriel River

Source: Metro 2021k
Note: LADWP = Los Angeles Department of Water and Power

4.16.2.3 Community Facilities

Community facilities identified within the Affected Area for parklands include schools, places of worship, emergency services, government offices, health services, museums, library facilities, and other social services (i.e., cemetery, adult care, social assistance). Table 4.16.3 summarizes the community facilities identified within 0.25 mile of the Build Alternatives.

Table 4.16.3. Community Facilities Identified within 0.25-Mile of Build Alternatives

Community Facility[1]	Alternative 1	Alternative 2	Alternative 3	Alternative 4
School Facility	45	49	34	15
Places of Worship	57	47	41	25
Emergency Services Facility	9	8	7	3
Government Offices	33	18	12	5
Health Services	12	11	7	5
Museum	17	6	2	2
Library Facility	3	3	3	3
Other Social Services (i.e., community centers, cemetery, adult care, social assistance)	23	29	10	5
Total	**199**	**171**	**116**	**63**

Source: Metro 2021k
Note: [1] Distance to the resource facility is measured from the nearest point of the project alignment, station, or MSF.

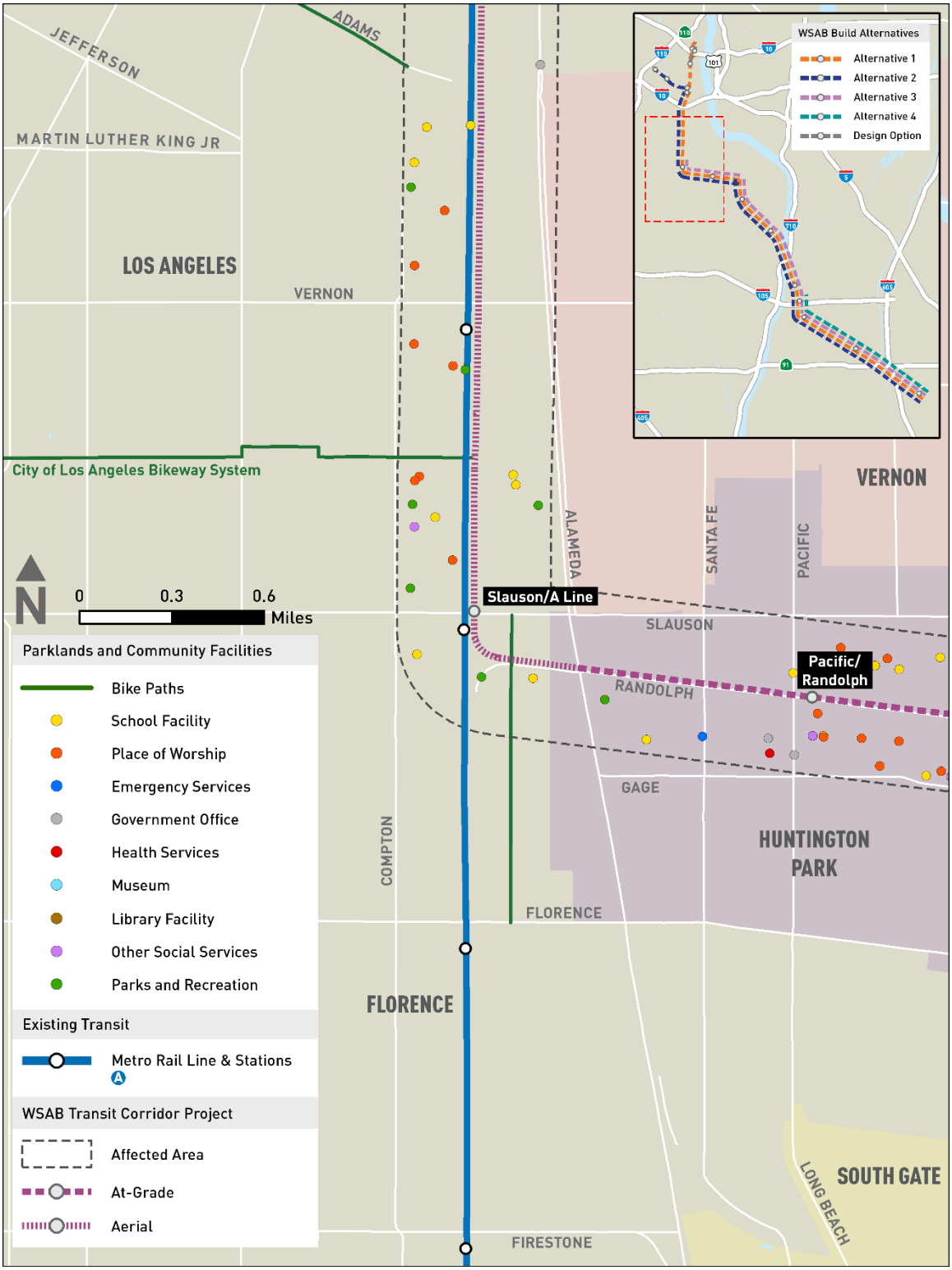
A total of 235 community facilities are identified within the parklands Affected Area for the Build Alternatives. Specifically, 199 community facilities are within the parklands Affected Area for Alternative 1, 171 for Alternative 2, 117 for Alternative 3, and 63 for Alternative 4.[8] Eleven community facilities are identified within 0.25 mile of the Paramount MSF site option. Three community facilities are located within 0.25 mile of the Bellflower MSF site option. Figure 4.16-1 through Figure 4.16-6 identify the approximate locations of the parklands, community facilities, and bike facilities located within 0.25 mile of the Build Alternatives.

[8] Facilities are not mutually exclusive to each Alternative, and individual facilities may be present in the Affected Area of multiple Alternatives.

Figure 4.16-1. Parkland, Bike Facilities, and Community Facilities within 0.25-Mile of the Build Alternatives (Los Angeles Union Station to 38th Street, Los Angeles)

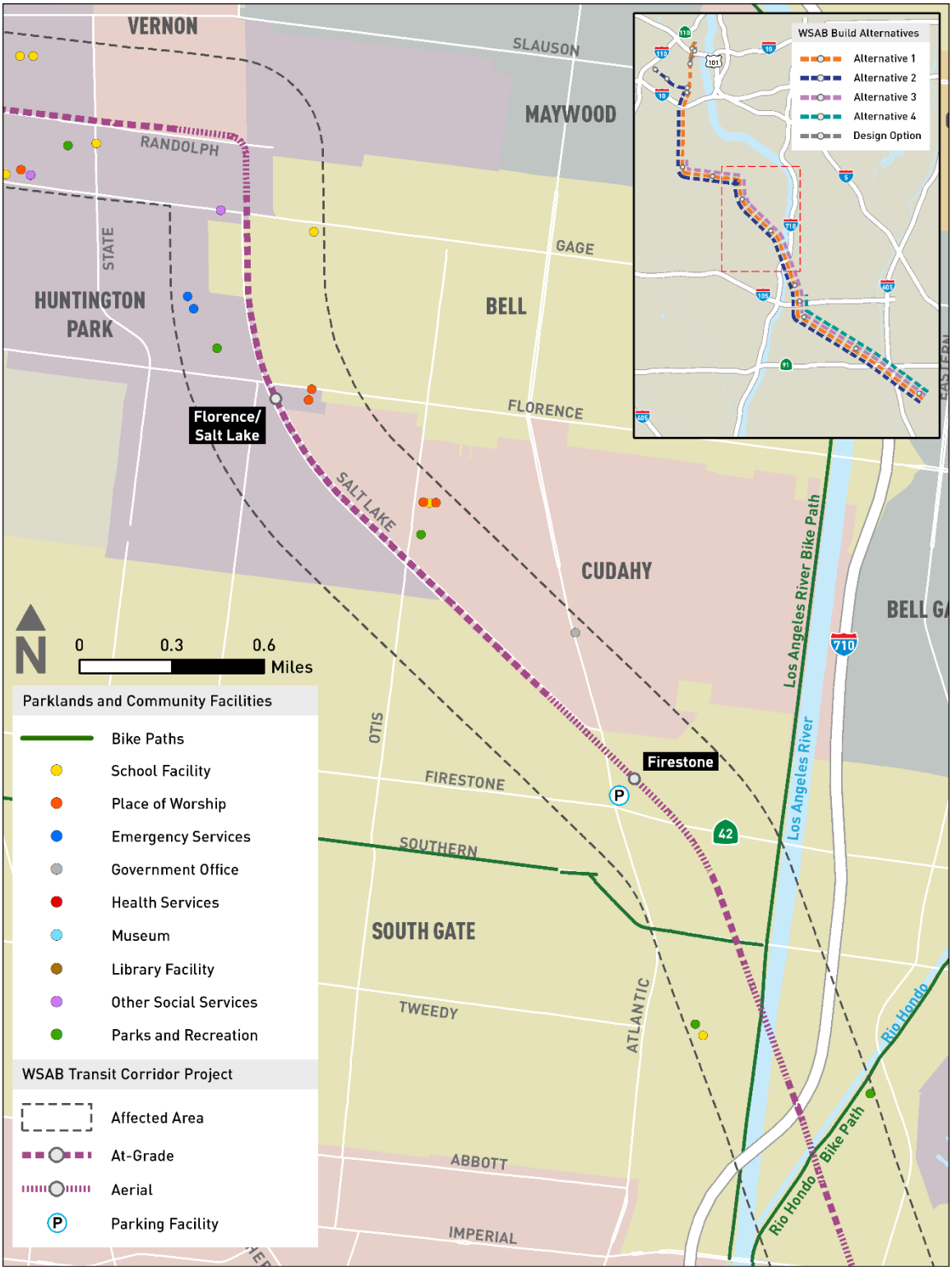
Source: Metro 2021k

Figure 4.16-2. Parkland, Bike Facilities, and Community Facilities within 0.25-Mile of the Build Alternatives (38th Street, Los Angeles to Pacific/Randolph Station)



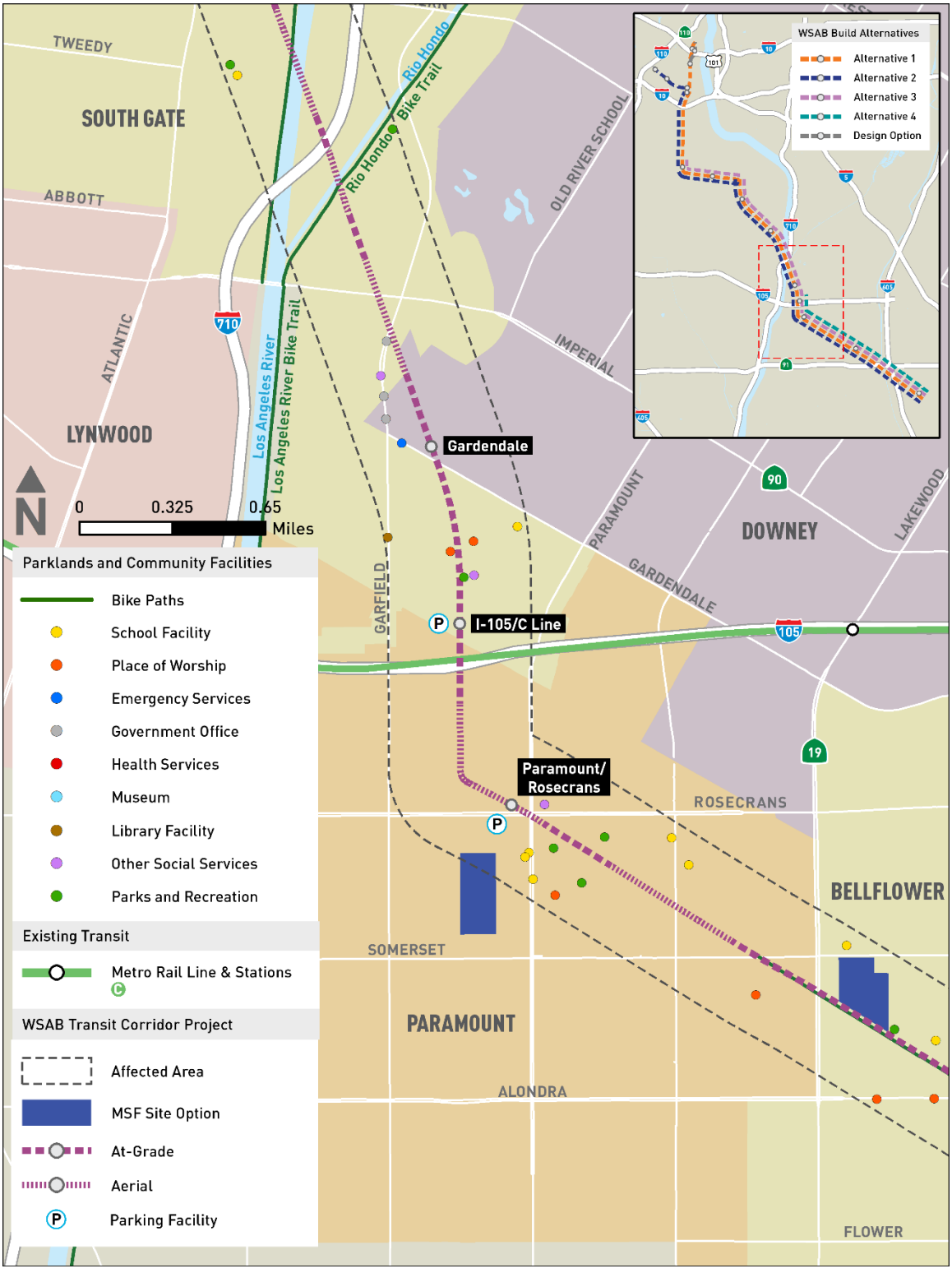
Source: Metro 2021k

Figure 4.16-3. Parkland, Bike Facilities, and Community Facilities within 0.25-miles of the Build Alternatives (Pacific/Randolph Station to Imperial Highway, South Gate)



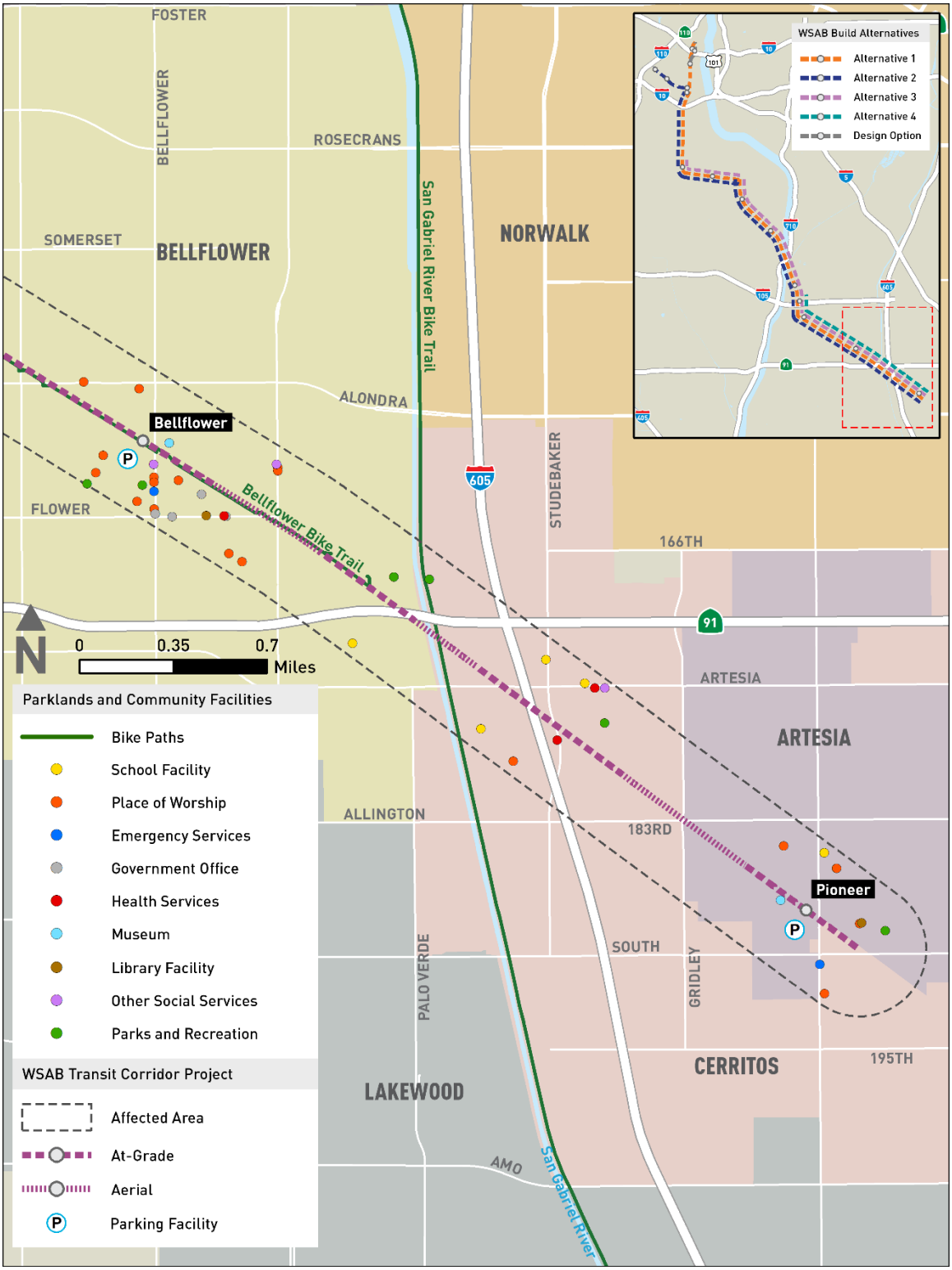
Source: Metro 2021k

Figure 4.16-4. Parkland, Bike Facilities, and Community Facilities within 0.25-Mile of the Build Alternatives (Imperial Highway, South Gate to Alondra Boulevard, Bellflower)



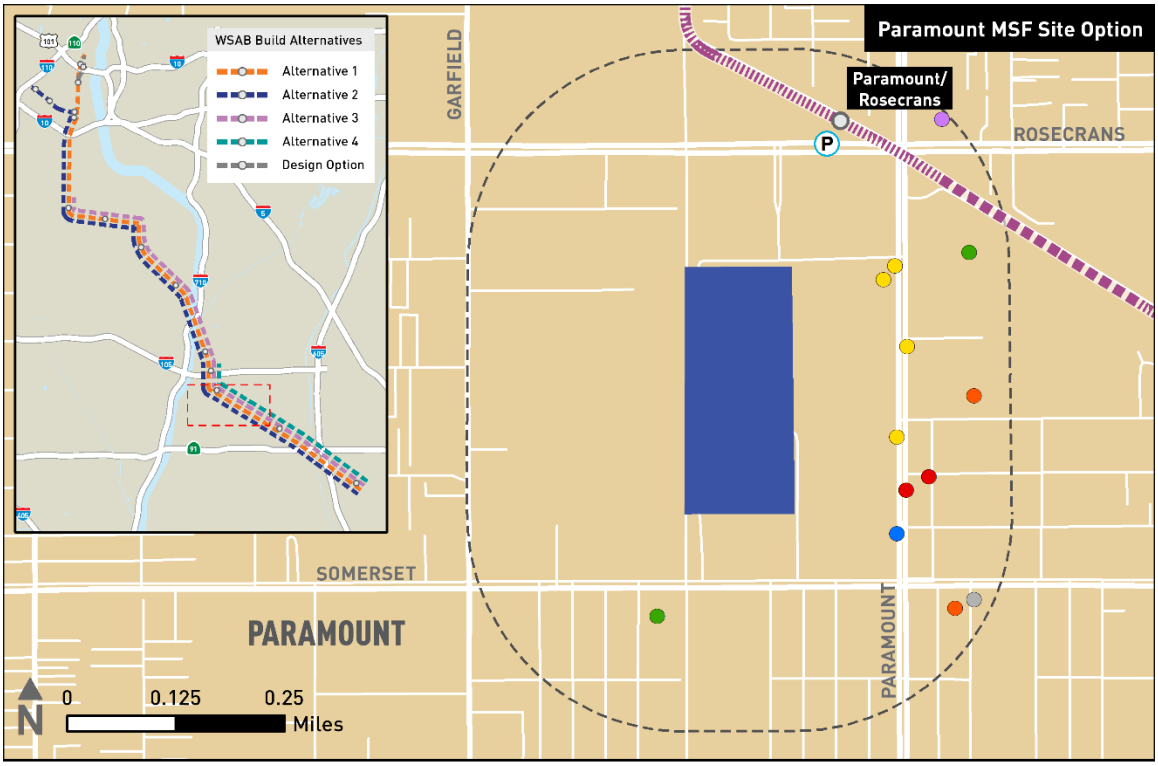
Source: Metro 2021k

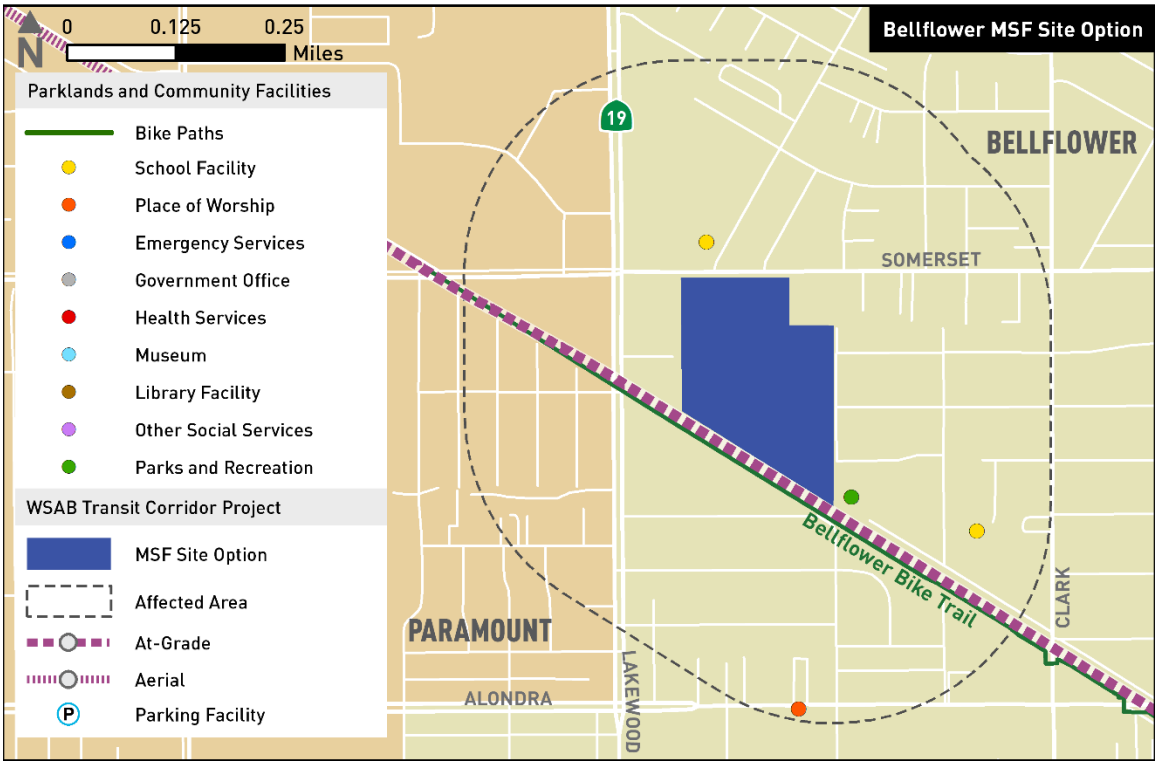
Figure 4.16-5. Parkland, Bike Facilities, and Community Facilities within 0.25-Mile of the Build Alternatives (Alondra Boulevard, Bellflower to South Street, Artesia)



Source: Metro 2021k

Figure 4.16-6. Parkland, Bike Facilities, and Community Facilities within 0.25-Mile of the MSF Site Options





Source: Metro 2021k

4.16.3 Environmental Consequences/Environmental Impacts

4.16.3.1 No Build Alternative

Under the No Build Alternative, projects identified in the Southern California Association of Governments *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy*, Metro's 2009 *Long Range Transportation Plan*, and Measure M, as well as local projects, would continue to be built, which may result in adverse effects to parklands, bike facilities, or community facilities. Under NEPA, the No Build Alternative is not expected to result in adverse effects related to parklands, bike facilities, or community facilities.

4.16.3.2 Alternative 1: Los Angeles Union Station to Pioneer Station

Parklands

Acquisition: Alternative 1 would be located within street ROWs and rail ROWs, or within acquired properties, and not on or through parklands and recreational facilities. Proposed TPSS sites and structures, as well as proposed parking facilities would be located on properties currently developed with surface parking lots, commercial uses, industrial uses, or that are vacant and abutting the proposed alignment. TPSS sites would be located underground for underground segments of the alignment. No property acquisitions for Alternative 1 are required at or around the identified parkland and recreational facilities that would result in displacements or relocation of these facilities.

Paramount Park's northern boundary is separated from the proposed alignment by a 110-foot LADWP-owned utility right-of-way. In addition to this utility right-of-way, a 40-foot-wide strip owned by Metro is leased to the City of Paramount and designated for "[p]arking and landscaping for Paramount Park only, and no other uses." Exhibit E to the lease states that "there is a possibility that the West Santa Ana Branch will be selected as a rail connector with Orange County. If such a decision is made, Metro will probably require the return of the entire right-of-way adjacent to Paramount Park." Per 23 Code of Federal Regulations 774.11(h), the property was reserved in the lease agreement for future transportation use while functioning temporarily to support park use.[9]

Alternative 1 would require a partial property acquisition of the LADWP utility right-of-way to accommodate the track alignment, Paramount Bike Trail, and a permanent aerial easement on public ROW at the corner of Paramount Boulevard and Rosecrans Avenue, and along the northern boundary of Paramount Park. The primary use of the LADWP utility right-of-way is not for recreational uses and would not directly affect the function of Paramount Park or the Paramount Bike Trail. Alternative 1 would require termination of the lease agreement between Metro and the City of Paramount for the 40-foot-wide section of the Metro-owned ROW currently used for parking and landscaping by Paramount Park. The reversion of the leased parking area does not require property acquisition within the Paramount Park boundary. Park recreational facilities and buildings would not be disturbed, and the general function of Paramount Park would remain unchanged. Property acquisitions would comply with all applicable federal and state requirements, including the Federal Uniform Relocation Assistance and Real Property Acquisition Act of 1971 and the California Relocation Act (see *West Santa Ana Branch Transit Corridor Project Displacements and Acquisitions Impact Analysis*

[9] License Agreement A000604 acknowledges that the return of the entire ROW adjacent to Paramount Park is a possibility for the WSAB rail connector project.

Report [Metro 2021m], attached as Appendix H to this Draft EIS/EIR). Alternative 1 would not result in an adverse effect related to displacement or acquisition of a park.

Parking: Off-site parking at Salt Lake Park and on-site parking at Paramount Park would be affected. Approximately 114 off-site parking spaces located within the San Pedro Subdivision ROW along the northbound side of Salt Lake Avenue between Bell Avenue and Florence Avenue are currently used by Salt Lake Park visitors. Alternative 1 would require the removal/relocation of the off-site parking spaces; however, removal of the parking spaces would not result in an adverse effect related to parking or use of Salt Lake Park because other parking would remain available. The Salt Lake Park on-site parking lot along Salt Lake Avenue with approximately 58 parking spots and the 7 off-site parking spaces along the eastbound side of Salt Lake Avenue between Bell Avenue and Florence Avenue would not be affected. Street parking along Florence Avenue and Bissell Street in addition to other on-site and off-site parking around Salt Lake Park would remain unaffected. The general function of Salt Lake Park would not be impacted. Alternative 1 would require termination of the lease agreement between Metro and the City of Paramount for the 40-foot-wide section of the Metro-owned ROW to accommodate the at-grade alignment and aerial easement. The area is currently used for parking and landscaping by Paramount Park. Alternative 1 would affect approximately 20 (of over 300) on-site parking spaces on the northern portion of Paramount Park. However, the remaining approximately 280 on-site parking spots would be maintained to the extent feasible and off-site parking on Paramount Boulevard would not be affected. Park and recreational facilities and buildings would not be disturbed, and the general function of Paramount Park would remain unchanged. Under NEPA, Alternative 1 would not result in an adverse effect related to park parking.

Access: Alternative 1 would not obstruct vehicle or pedestrian access to and from the parklands and recreational facilities in the Affected Area for parklands. General access to the surrounding parks would be increased by providing new transit stations nearby park and recreational facilities. Furthermore, partial acquisition of the adjacent LADWP utility right-of-way and reversion of the leased parking in Paramount Park would not adversely affect existing vehicle and pedestrian access to the park, and access from Paramount Boulevard to Paramount Park would not be impacted. In addition to existing safety barriers, Alternative 1 would include additional safety barriers as necessary throughout the proposed alignment and in station areas for safety and to hinder illegal track crossings. Pedestrian and vehicular access to parklands and recreational facilities would be maintained at intersections and not impeded. Under NEPA, Alternative 1 would not result in an adverse effect related to park access.

Bike Facilities

The existing and planned bike paths identified along Alternative 1 would help achieve Metro's First and Last Mile objectives for transit-oriented communities and provide connectivity to the station areas and surrounding communities. Street improvements as part of Alternative 1 (e.g., grade separations, signaling) would also be implemented using the Metro Rail Design Criteria or equivalent as design guidance to keep bike facilities accessible.

Bike facilities within 0.25-mile of the alignment of Alternative 1 include the Class I, II, III, and IV bikeways of the City of LA Bikeway System, Los Angeles River Bike Path, Rio Hondo Bike Path, Paramount Bike Trail, Bellflower Bike Trail, San Gabriel River Mid-Trail, and bikeways maintained by the County of Los Angeles (Figure 4.16-1 through Figure 4.16-5). A portion of the alignment would be aerial and cross above the Los Angeles River Bike Path

and the Rio Hondo Bike Path in the City of South Gate via new bridges that span the river channels, and also cross over the San Gabriel River Mid-Trail via the existing rail ROW bridge. As such, access to and from these bike paths would not be affected.

Alternative 1 would be adjacent to the Paramount Bike Trail and Bellflower Bike Trail, located parallel along and partially within the PEROW. Operation of Alternative 1 within segments of the PEROW extending south from the intersection of Rosecrans Avenue and Paramount Boulevard to Lakewood Boulevard may not have sufficient room to accommodate the project alignment and operate the Paramount Bike Trail safely, which may require a realignment of the Paramount Bike Trail. Specifically, the Paramount Bike Trail segment between Somerset Boulevard and Lakewood Boulevard is located within the PEROW and would require a removal of an approximately 930-foot-long segment of the existing Paramount Bike Trail to accommodate the track alignment. Alternative 1 would install tracks along the southwest side of the PEROW along this segment requiring the realignment of this segment of the existing bike trail to the north side of the PEROW. The relocation of this segment of the Paramount Bike Trail would require users of the bike trail to cross the railroad tracks at Lakewood Boulevard to access the bike trail across the street. Although segments of the Paramount Bike Trail would be realigned, the bike trail would remain operational and continue to be used by the community, and access to and from the bike path would not be affected. This segment of the existing bike trail is located at the end of the Paramount Bike Trail and access to and from these bike paths would not be affected.

Additionally, Alternative 1 would require realignment of the Bellflower Bike Trail segment east of Bellflower Boulevard on the north side of the PEROW and relocation of a bus stop to accommodate the Bellflower Station platform and tracks. Although segments of the bike trails would be realigned, the bike trail would remain within the PEROW; the function of the bike trail would be maintained; and access to and from the bike path would not be affected. The bike trail and bus stop would continue to be available for use by the community. Implementation of Mitigation Measure LU-1 (Consistency with Bike Plans) as discussed in Section 4.1.4 of the Land Use Section would be effective to demonstrate that modifications to the bicycle facilities would maintain continuity with other segments of the Paramount Bike Trail and Bellflower Bike Trail. Therefore, with the implementation of mitigation, Alternative 1 would not result in an adverse effect related to access to existing bike facilities.

Alternative 1 could preempt future development and implementation of the planned Class 1 bicycle path along Salt Lake Avenue and the Class I bicycle path north of Rayo Avenue and south of the Los Angeles River, identified in the City of Huntington Park Bicycle Transportation Master Plan, City of Cudahy 2040 General Plan, South Gate Bicycle Transportation Plan, and the City of Bell Bicycle Master Plan. However, while planned, the bike facilities are unfunded and not scheduled for implementation. Therefore, they are remote and speculative.

Under Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro would continue to coordinate with jurisdictions and local agencies to minimize the preemption of future development, goals, and plans within each jurisdiction. As part of this effort, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Additional discussion on the Build Alternatives and bicycle paths as it relates to land use planning may be found in Section 4.1.3.

Community Facilities

Acquisition: Table 4.16.4 summarizes effects to community facilities along the Alternative 1 alignment. Property acquisitions would be required for permanent underground easements for tunneling; to accommodate aerial columns and structures, grade separations and track alignment; TPSS sites and structures; and parking facilities. Permanent underground easements for tunneling would be required but would not affect aboveground uses or include areas with recreational use. Other proposed TPSS sites, ancillary structures, and parking facilities would be located on properties currently developed with surface parking lots, commercial uses, industrial uses, or that are vacant and abut the proposed alignment. Proposed parking facilities for the Build Alternatives would not be located on properties with community facilities. Partial property acquisitions would not disturb existing buildings or change or impact the functionality of the community facilities. Under NEPA, Alternative 1 would not result in an adverse effect related to the functionality of the community facilities.

Parking: Partial property acquisitions would not affect on-site or street parking for community facilities. Under NEPA, Alternative 1 would not result in an adverse effect related to community facility parking.

Access: Alternative 1 would be underground, aerial, or at-grade in the street ROW, rail ROW, or within acquired properties and would not affect vehicle or pedestrian access to community facilities during operation. Access points to the affected community facilities would not be changed or impacted, and accessibility to community facilities to the nearest station areas would be enhanced. Partial property acquisitions would avoid impacting access points to community facilities, and pedestrian and vehicular access to community facilities would be maintained and not impeded. Under NEPA, Alternative 1 would not result in an adverse effect related to community facility access.

Table 4.16.4 Effects to Community Facilities Located within 0.25 Mile of Build Alternatives

Build Alternatives	Facility Name	Type of Acquisition	Loss of Supporting Street Parking	Affects Vehicle Access	Affects Pedestrian Access
1	**Japanese American National Museum** 369 E. 1st St, Los Angeles	Partial acquisition; permanent underground easement	No	No	No
1, 2, 3	**Community of Faith Bible Church** 12025 Industrial Ave, Huntington Park	Partial acquisition; grade crossing; southwestern corner of the property	No	No	No
1, 2, 3	**San Antonio Elementary School** 6222 State St, Huntington Park	Partial acquisition; grade crossing; edge of the property closest to the public sidewalks	No	No	No

Source: Metro 2021k
Note: TPSS = traction power substation

4.16.3.3 Alternative 2: 7th Street/Metro Center to Pioneer Station

Parklands

Acquisition: Similar to Alternative 1, Alternative 2 would not be located on or through parklands and recreational facilities and would result in the same partial property acquisition of a LADWP utility right-of-way along Paramount Park. Property acquisitions would comply with all applicable federal and state requirements, including the Uniform Relocation Assistance, Real Property Acquisition Act of 1971, and the California Relocation Act. Under NEPA, Alternative 2 would not result in an adverse effect related to displacement or acquisition of a park.

Parking: Parking impacts resulting from Alternative 2 would be the same as Alternative 1. As discussed for Alternative 1 in Section 4.16.3.2, removal of the off-site parking spaces used by Salt Lake Park visitors and on-site parking in Paramount Park would not result in an adverse effect as adequate parking would still be available. The general function of Salt Lake Park and Paramount Park would not be impacted. Under NEPA, Alternative 2 would not result in an adverse effect related to park parking.

Access: Similar to Alternative 1, pedestrian and vehicular access to parklands and recreational facilities would be maintained at intersections and not impeded. Accessibility to parklands and recreational facilities may be improved by having a nearby transit station. Existing and proposed safety barriers along the proposed alignment hinder illegal track crossings, but do not limit park access at legal locations. Under NEPA, Alternative 2 would not result in an adverse effect related to park access.

Bike Facilities

Alternative 2 includes the same bike paths as Alternative 1 and would result in the same changes to the Paramount Bike Trail and Bellflower Bike Trail. Realignment of segments of the Paramount Bike Trail and Bellflower Bike Trail would not result in adverse physical effects or prevent access to existing bike facilities. Mitigation Measure LU-1 (Consistency with Bike Plans) would be implemented to maintain connectivity. Alternative 2 could preempt future development and implementation of the planned Class 1 bicycle path along Salt Lake Avenue and the Class I bicycle path north of Rayo Avenue and south of the Los Angeles River, identified in the City of Huntington Park Bicycle Transportation Master Plan, City of Cudahy 2040 General Plan, South Gate Bicycle Transportation Plan, and the City of Bell Bicycle Master Plan. However, while planned, the bike facilities are unfunded and not scheduled for implementation. Therefore, they are remote and speculative.

Under Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro would continue to coordinate with jurisdictions and local agencies to minimize the preemption of future development, goals, and plans within each jurisdiction. As part of this effort, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Additional discussion on the Build Alternatives and bicycle paths as it relates to land use planning may be found in Section 4.1.3.

Community Facilities

Acquisition: Partial property acquisitions required for Alternative 2 would be the same as discussed for Alternative 1. Similar to Alternative 1 and shown in Table 4.16.4, Alternative 2 may affect the

Community of Faith Bible Church and San Antonio Elementary School. The partial property acquisitions would not change or impact the functionality of the facilities and the proposed parking facilities would not be located on properties with community facilities. Under NEPA, Alternative 2 would not result in an adverse effect related to the functionality of community facilities.

Parking: Similar to Alternative 1, Alternative 2 would not affect on-site or street parking for community facilities. Under NEPA, Alternative 2 would not result in an adverse effect related to community facility parking.

Access: Similar to Alternative 1, Alternative 2 partial property acquisitions would avoid impacting access points to community facilities, and pedestrian and vehicular access to community facilities would be maintained and not impeded. Under NEPA, Alternative 2 would not result in an adverse effect related to community facility access.

4.16.3.4 Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Parklands

Acquisition: Alternative 3 would have a shorter alignment than Alternatives 1 and 2, would not be located on or through parklands and recreational facilities, and would result in the same partial property acquisition of a LADWP utility right-of-way along Paramount Park. Property acquisitions would comply with all applicable federal and state requirements, including the Uniform Relocation Assistance, Real Property Acquisition Act of 1971, and the California Relocation Act. Under NEPA, Alternative 3 would not result in an adverse effect related to displacement or acquisition of a park.

Parking: Similar to Alternatives 1 and 2, off-site parking used by Salt Lake Park visitors and on-site parking at Paramount Park would be affected. As discussed in Section 4.16.3.2, removal of the parking spaces would not result in an adverse effect as adequate parking would still be available. The general function of Salt Lake Park and Paramount Park would not be impacted. Under NEPA, Alternative 3 would not result in an adverse effect related to park parking.

Access: Similar to Alternatives 1 and 2, pedestrian and vehicular access to parklands and recreational facilities would be maintained at intersections and not impeded. Accessibility to parklands and recreational facilities may be improved by having a nearby transit station. Existing and proposed safety barriers along the proposed alignment would increase safety and hinder illegal track crossings. Under NEPA, Alternative 3 would not result in an adverse effect related to park access.

Bike Facilities

Similar to Alternatives 1 and 2, Alternative 3 includes the same bike paths and would result in the same changes to the Paramount Bike Trail and Bellflower Bike Trail. Realignment of segments of the Paramount Bike Trail and Bellflower Bike Trail would not result in adverse physical effects or prevent access to existing bike facilities. Mitigation Measure LU-1 (Consistency with Bike Plans) would be implemented to maintain connectivity. Alternative 3 could preempt future development and implementation of the planned Class 1 bicycle path along Salt Lake Avenue and the Class I bicycle path north of Rayo Avenue and south of the Los Angeles River, identified in the City of Huntington Park Bicycle Transportation Master Plan, City of Cudahy 2040 General Plan, South Gate Bicycle Transportation Plan, and the City of Bell Bicycle Master Plan. However, while planned, the bike facilities are unfunded and not scheduled for implementation. Therefore, they are remote and speculative.

Under Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro would continue to coordinate with jurisdictions and local agencies to minimize the preemption of future development, goals, and plans within each jurisdiction. As part of this effort, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Additional discussion on the Build Alternatives and bicycle paths as it relates to land use planning may be found in Section 4.1.3.

Community Facilities

Acquisition: Partial property acquisitions required for Alternative 3 would be the same as discussed for Alternatives 1 and 2, and may affect the Community of Faith Bible Church and San Antonio Elementary School. The partial property acquisitions would not change or impact the functionality of the facilities and the proposed parking facilities would not be located on properties with community facilities. Under NEPA, Alternative 3 would not result in an adverse effect related to the functionality of community facilities.

Parking: Similar to Alternatives 1 and 2, Alternative 3 would not affect on-site or street parking for community facilities. Under NEPA, Alternative 3 would not result in an adverse effect related to community facility parking.

Access: Similar to Alternatives 1 and 2, partial property acquisitions would avoid impacting access points to community facilities, and pedestrian and vehicular access to community facilities would be maintained and not impeded. Under NEPA, Alternative 3 would not result in an adverse effect related to community facility access.

4.16.3.5 Alternative 4: I-105/C (Green) Line to Pioneer Station

Parklands

Acquisition: Alternative 4 would have a shorter alignment than Alternatives 1, 2, and 3 and would not be located on or through parklands and recreational facilities. Similarly, Alternative 4 would result in the same partial property acquisition of a LADWP utility right-of-way along Paramount Park. Property acquisitions would comply with all applicable federal and state requirements, including the Uniform Relocation Assistance, Real Property Acquisition Act of 1971, and the California Relocation Act. Under NEPA, Alternative 4 would not result in an adverse effect related to displacement or acquisition of a park.

Parking: Alternative 4 would have a shorter alignment than Alternatives 1, 2, and 3, and would not impact parking at Salt Lake Park. Similar to Alternatives 1, 2, and 3, on-site parking at Paramount Park would be affected. However, this would not result in an adverse effect as adequate parking would still be available. The general function of Paramount Park would not be impacted. Under NEPA, Alternative 4 would not result in an adverse effect related to park parking.

Access: Similar to Alternatives 1, 2, and 3, pedestrian and vehicular access to parklands and recreational facilities would be maintained at intersections and not impeded. Instead, accessibility to parklands and recreational facilities may be improved by having a nearby transit station. Existing and proposed safety barriers along the proposed alignment would increase safety and hinder illegal track crossings. Under NEPA, Alternative 4 would not result in an adverse effect related to park access.

Bike Facilities

Similar to Alternatives 1, 2, and 3, Alternative 4 includes the same bike paths and would result in the same changes to the Paramount Bike Trail and Bellflower Bike Trail. Realignment of segments of the Paramount Bike Trail and Bellflower Bike Trail would not result in adverse physical effects or prevent access to existing bike facilities. Mitigation Measure LU-1 (Consistency with Bike Plans) would be implemented to maintain connectivity. Alternative 4 could preempt future development and implementation of the planned Class 1 bicycle path along Salt Lake Avenue and the Class I bicycle path north of Rayo Avenue and south of the Los Angeles River, identified in the City of Huntington Park Bicycle Transportation Master Plan, City of Cudahy 2040 General Plan, South Gate Bicycle Transportation Plan, and the City of Bell Bicycle Master Plan. However, while planned, the bike facilities are unfunded and not scheduled for implementation. Therefore, they are remote and speculative.

Under Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro would continue to coordinate with jurisdictions and local agencies to minimize the preemption of future development, goals, and plans within each jurisdiction. As part of this effort, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Additional discussion on the Build Alternatives and bicycle paths as it relates to land use planning may be found in Section 4.1.3.

Community Facilities

Acquisition: Similar to Alternatives 1, 2 and 3, partial property acquisitions would be required for permanent aerial easements, to accommodate grade separations and track alignment, TPSS sites and structures, and parking facilities. The partial property acquisitions would not change or impact the functionality of existing facilities and the proposed parking facilities would not be located on properties with community facilities. Under NEPA, Alternative 4 would not result in an adverse effect related to the functionality of community facilities.

Parking: Alternative 4 would not affect on-site or street parking used by visitors of community facilities. Under NEPA, Alternative 4 would not result in an adverse effect related to community facility parking.

Access: Similar to Alternatives 1, 2 and 3, partial property acquisitions would avoid impacting access points to community facilities, and pedestrian and vehicular access to community facilities would be maintained and not impeded. Under NEPA, Alternative 4 would not result in an adverse effect related to community facility access.

4.16.3.6 Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station

Parklands: Design Options 1 and 2 would be located underground and would not require the acquisition or displacement of parklands and recreational facilities. The nearest parkland would be Los Angeles Plaza Park located approximately 530 feet from Design Option 1. Under NEPA, Design Options 1 and 2 would not result in an adverse effect related to parklands and recreational facilities.

Bike Facilities: Design Options 1 and 2 would be located underground and would not impede or affect access to and from the bikeways. Under NEPA, Design Options 1 and 2 would not result in an adverse effect related to bike facilities.

Community Facilities: Design Options 1 and 2 would not require the acquisition of community facility properties as these design options would be primarily underground. In addition, Design Options 1 and 2 would not affect on- or off-site parking or impede vehicle and pedestrian access used for surrounding community facilities. Under NEPA, Design Options 1 and 2 would not result in an adverse effect related to community facilities.

4.16.3.7 Maintenance and Storage Facility

Paramount MSF Site Option

Parklands: The Paramount MSF site option site is currently developed with the Paramount Swap Meet, Paramount Drive-in Theatre, and parking. No parkland and recreational facilities are located on the site for the Paramount MSF site option with the nearest parkland (Paramount Park) located approximately 719 feet east of the Paramount MSF site option. The Paramount MSF site option would not affect on-site or street parking used by visitors to Paramount Park. Pedestrian and vehicle access to Paramount Park would be maintained and would not be impeded. Under NEPA, the Paramount MSF site option would not result in an adverse effect related to parklands and recreational facilities.

Bike Facilities: No bike paths are located adjacent to or would cross the Paramount MSF site option. Under NEPA, the Paramount MSF site option would not result in an adverse effect related to bike facilities.

Community Facilities: Existing uses on the Paramount MSF site option are not identified as a community facility. The property site would require a full property acquisition. The Paramount MSF site option would not affect on-site or street parking used by the surrounding community facilities. Access to surrounding community facilities would be maintained and vehicle or pedestrian access would not be impeded. Under NEPA, the Paramount MSF site option would not result in an adverse effect related to community facilities.

Bellflower MSF Site Option

Parklands: The Bellflower MSF site option site is city-owned, designated as Open Space by the City of Bellflower, and currently leased by the city for use as a recreational commercial business (Hollywood Sports Park and Bellflower BMX). The recreational commercial business is not a public parkland or recreational facility and acquisition of this property would be required. The City of Bellflower has confirmed that the site currently operates as a commercial business, that the property is not designated as a significant park or recreation area, and is not designated as having an important role in meeting the park and recreation objectives of the city. Metro continues to undergo extensive coordination with the city. Based on this coordination it is anticipated that the city would amend the General Plan so that the MSF facility use would be consistent with an appropriate city land use designation. Under NEPA, the Bellflower MSF site option would not result in adverse effects related to consistency with local land use plans, policies, and regulations.

The nearest parkland is the Flora Vista Dog Park located adjacent to the southeastern edge of the property. The Bellflower MSF site option would not affect on-site or street parking used by visitors to Flora Vista Dog Park. Pedestrian and vehicle access to Flora Vista Dog Park would be maintained and would not be impeded.

Bike Facilities: The Bellflower Bike Trail segment from Lakewood Boulevard south to Clark Avenue is located within the PEROW and south of the proposed Bellflower MSF site option. This segment of the PEROW may not have sufficient room to accommodate the MSF site option lead tracks, LRT tracks, and operate the Bellflower Bike Trail safely. This may require a realignment in this segment of the Bellflower Bike Trail to maintain connectivity with the Paramount Bike Trail west of Lakewood Boulevard and the other segments of the Bellflower Bike Trail. Implementation of Mitigation Measure LU-1 (Consistency with Bike Plans) as discussed in Section 4.1.4 of the Land Use Section would be effective to demonstrate that modifications to the bicycle facilities would maintain continuity with other segments of the Paramount Bike Trail and Bellflower Bike Trail. Thus, as all functions of the MSF would be located within the facility; the lead tracks would be located within the PEROW; the Bellflower MSF site option would not impair the function of the bike trail; and access to and from the bike trail would be maintained. Under NEPA, with implementation of this mitigation measure, the Bellflower MSF site option would not result in an adverse effect related to bike facilities.

Community Facilities: The Bellflower MSF site option is currently used for a recreational commercial business and is not identified as a community facility. The site would require a full property acquisition, which would not affect on-site or street parking used by the surrounding community facilities. Access to surrounding community facilities would be maintained and vehicle or pedestrian access would not be impeded. Under NEPA, the Bellflower MSF site option would not result in an adverse effect related to community facilities.

4.16.4 Project Measures and Mitigation Measures

4.16.4.1 Project Measures

There are no project measures required by law or permit related to parklands and community facilities.

4.16.4.2 Mitigation Measures

Refer to Mitigation Measure LU-1 **(**Consistency with Bike Plans) in Section 4.1.4 of the Land Use Section.

4.16.5 California Environmental Quality Act Determination

4.16.5.1 Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable standards for any park or recreational facility?

No Project Alternative

Under the No Project Alternative, plans for bike paths proposed within or along the rail ROW could be implemented and would not be affected by the Project. These bike paths would enhance and connect with existing active transportation corridors for the cities. The No Project Alternative would not impact off-site or on-site parking used for parklands or governmental facilities and would not result in the need for the expansion of or construction of new parkland or governmental facilities. In addition, the No Project Alternative would not provide greater accessibility to nearby parklands and governmental facilities as the Build Alternatives. Therefore, impacts to parks or recreational facilities and governmental facilities would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

Alternative 1 is an infrastructure improvement project in an urban setting that would provide a mode of transportation, accessibility, and connectivity in the surrounding communities. Alternative 1 would not directly create or increase the residential population of the surrounding communities that would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities. Instead, accessibility to parklands, recreational facilities, and governmental facilities may be improved by having a nearby transit station. Realignment of segments of the Paramount Bike Trail and Bellflower Bike Trail would not result in adverse physical effects or prevent access to bike facilities, and impacts would be less than significant. Nonetheless, Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, would be implemented to maintain connectivity and further reduce impacts to a less than significant level as it relates to connectivity.

As discussed in Section 4.16.3.2, Alternative 1 could preempt future development and implementation of the planned Class I bicycle path along Salt Lake Avenue and the planned Class I bicycle path north of Rayo Avenue and south of the Los Angeles River, identified in the *City of Huntington Park Bicycle Transportation Master Plan*, *City of Cudahy 2040 General Plan*, *South Gate Bicycle Transportation Plan*, and *City of Bell Bicycle Master Plan*, and would result in a significant and unavoidable impact. Converting the planned Class I bicycle paths into Class II or Class III bicycle paths is feasible and would maintain the connectivity identified in the bicycle master plans. However, the reclassification of the bike paths is considered an inconsistency with the current bike plans and a significant impact would occur.

Metro continues to coordinate with jurisdictions and local agencies so that Alternative 1 would not preempt future development, goals, and plans within each jurisdiction. Under Mitigation Measure LU-1(Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro would continue to coordinate with jurisdictions and local agencies to minimize the preemption of future development, goals, and plans within each jurisdiction. As part of this effort, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. As such, despite Metro's best efforts and coordination and with the implementation of mitigation, Alternative 1 may still preempt future development and the implementation of the planned bike paths and limit access to bicycle facilities. Therefore, even with implementation of mitigation, Alternative 1 would result in a significant and unavoidable impact.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans)

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Similar to Alternative 1, Alternative 2 would not directly create or increase the residential population of the surrounding communities that would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities and impacts would be less than significant. Nonetheless, Mitigation Measure LU-1 (Consistency with Bike Plans) would be implemented to maintain connectivity of the bike trails and further reduce impacts to a less than significant level.

As discussed in Section 4.16.3.2, Alternative 2 could preempt future development and implementation of the same planned bike paths identified in bicycle master plans for the Cities of Huntington Park, Bell, and South Gate and the City of Cudahy General Plan resulting in a significant and unavoidable impact. Implementation of Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, would be required. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Similar to Alternative 1, Alternative 2 may still preempt future development and implementation of the future bike paths. Therefore, impacts would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans)

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Similar to Alternatives 1 and 2, Alternative 3 would not directly create or increase the residential population of the surrounding communities that would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities and impacts would be less than significant. Nonetheless, Mitigation Measure LU-1 (Consistency with Bike Plans) would be implemented to maintain connectivity of the bike trails and further reduce impacts to a less than significant level.

As discussed in Section 4.16.3.2, Alternative 3 could preempt future development and implementation of the same planned bike paths identified in bicycle master plans for the Cities of Huntington Park, Bell, Cudahy, South Gate, and the City of Cudahy General Plan resulting in a significant and unavoidable impact. Implementation of Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, would be required. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Similar to Alternatives 1 and 2, Alternative 3 may still preempt future development and implementation of the future bike paths. Therefore, impacts would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans)

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Similar to Alternatives 1, 2 and 3, Alternative 4 would not directly create or increase the residential population of the surrounding communities that would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities and impacts would be less than significant. Nonetheless, Mitigation Measure LU-1 (Consistency with Bike Plans) would be implemented to maintain connectivity of the bike trails and further reduce impacts to a less than significant level.

As discussed in Section 4.16.3.2, Alternative 4 could preempt future development and implementation of the same planned bike path identified in the bicycle master plan for the City of South Gate resulting in a significant and unavoidable impact. Implementation of Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, would be required. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. Similar to Alternatives 1, 2, and 3, Alternative 4 may still

preempt future development and implementation of the future bike paths. Therefore, impacts would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans)

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Design Options 1 and 2 would not directly generate new residential populations that would result in the need for new public recreational facilities or increase the use of existing parks or government facilities. Design Options 1 and 2 would be underground and not affect the functionality of parklands and recreation facilities, bike facilities, and government facilities. Therefore, impacts would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Paramount MSF Site Option: The Paramount MSF site option would not result in physical impacts to nearby parks or community facilities and would not generate a new residential population that would increase the need for new recreational facilities. In addition, no parklands and recreation facilities, bike facilities, and government facilities are located adjacent to or would cross the Paramount MSF site option. Therefore, impacts would be less than significant, and mitigation would not be required.

Bellflower MSF Site Option: The Bellflower MSF site option would not result in physical impacts to nearby public parks or community facilities and would not generate a new residential population that would increase the need for new recreational facilities. As discussed in Section 4.16.3.7, the City of Bellflower has confirmed that the site is designated as Open Space and currently leased by the city for use as a recreational commercial business (Hollywood Sports Park and Bellflower BMX). The property is not designated as a significant park or recreation area and is not designated as having an important role in meeting the park and recreation objectives of the city. The land is not a public parkland or recreational facility, or government facility. Based on this coordination it is anticipated that the city would amend the General Plan so that the MSF facility use would be consistent with an appropriate city land use designation.. Therefore, impacts would be less than significant, and mitigation would not be required.

4.16.5.2 Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Project Alternative

Under the No Project Alternative, plans for bike paths proposed within or along the rail ROW could be implemented and would not be affected by the Project. These bike paths would enhance and connect with existing active transportation corridors for the cities. The No Project Alternative would not directly increase the use of the existing neighborhood and regional parks, bike facilities, or other recreational facilities and would not accelerate physical deterioration of such facilities. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

Alternative 1 would improve accessibility to existing neighborhood parks, recreational facilities, and bike facilities by having a nearby transit station. Alternative 1 would not directly increase the local residential population that could result in an increased use of parklands and other recreational facilities. Instead, improved access to recreational facilities may result in more use by the local and surrounding communities. Occasionally, an increase in parkland and recreational facilities may occur during large community events such as fairs and festivals, in which the city departments would provide adequate services and resources to serve the attendees of these events. However, it is anticipated to be minimal and the potential increase in the use of parklands and recreational facilities is not anticipated to result in the need for construction of new parklands or community facilities.

Existing bike facilities within 0.25-mile of the alignment of Alternative 1 are summarized in Table 4.16.2. The existing Paramount Bike Trail and Bellflower Bike Trail would also need to be reconfigured to accommodate the Project, but changes would not accelerate physical deterioration of the bike facilities and connection would be maintained with the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans). As discussed in Section 4.16.5.1, several planned bike facilities would be required to re-categorized as Class II or Class III bicycle paths to accommodate the Project and to keep the bicycle networks connected within each city. Converting the planned Class I bicycle paths into Class II or Class III bicycle paths is feasible and would maintain the connectivity identified in the bicycle master plans. However, the reclassification of the bike paths is considered an inconsistency with the current bike plans and a significant impact would occur.

Nonetheless, as the Project is a transportation infrastructure project, Alternative 1 would not directly increase the local residential population that may result in increased use on the bike facilities. Greater accessibility to the bike facilities with nearby transit stations could result in increased use by the local and surrounding communities; however, the increased use is not expected to severely impact the infrastructure of the existing bike facilities as all maintenance on the bike facilities would be provided by the local city. Furthermore, the existing and planned bike facilities would be reconfigured with the coordination of each city so the bike facilities would be able to accommodate the Project while meeting city standards. It is anticipated that an increase in use would be minimal and would not result in the need for construction of new bike paths beyond what is already planned in the bike master plans. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternative 2 is a transportation infrastructure project and would not directly increase the local residential population that may result in an increased use of parklands, recreational facilities, and bike facilities. Similar to Alternative 1, Alternative 2 transit stations would improve accessibility to existing neighborhood parks, recreational facilities, and bike facilities that may result in more use at the facilities by the local and surrounding communities. However, the city departments would provide adequate services and resources to maintain the facilities to city standards. An increased use of parklands, recreational facilities, and bike facilities is anticipated to be minimal, would not severely impact the infrastructure of the facilities, and would not result in the need for construction of new parklands or community facilities. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Similar to Alternatives 1 and 2, Alternative 3 transit stations would improve accessibility to existing neighborhood parks, recreational facilities, and bike facilities that may result in more use at the facilities by the local and surrounding communities. However, this increase is anticipated to be minimal, would not severely impact the infrastructure of the facilities, and would not result in the need for construction of new parklands or community facilities. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Similar to Alternatives 1, 2 and 3, Alternative 4 transit stations would improve accessibility to existing neighborhood parks, recreational facilities, and bike facilities that may result in more use at the facilities by the local and surrounding communities. However, this increase is anticipated to be minimal, would not severely impact the infrastructure of the facilities, and would not result in the need for construction of new parklands or community facilities. Therefore, impacts would be less than significant, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Design Options 1 and 2 would not directly create new residential populations that may increase the use of existing parks, recreational facilities, and bike facilities in the surrounding communities. Although improved access to parks, recreational facilities, and bike facilities may result in more use by the local and surrounding communities, the city departments would provide adequate services and resources to maintain the facilities to city standards. Therefore, impacts would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Paramount MSF Site Option and Bellflower MSF Site Option: The Paramount and Bellflower MSF site options would not directly create new residential populations that may increase the use of existing parks, recreational facilities, and bike facilities in the surrounding communities. The MSF is a support facility for the Project and would provide maintenance and storage services and would not provide improved access to parks, recreational facilities, and bike facilities that may result in increased use. Therefore, impacts would be less than significant, and mitigation would not be required.

4.16.5.3 Would the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Project Alternative

Under the No Project Alternative, plans for bike paths proposed within or along the rail ROW could be implemented and would not be affected by the Project. These bike paths would enhance and connect with existing active transportation corridors for the cities and would undergo individual environmental clearance. Therefore, impacts would be less than significant, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

The Project is a transportation infrastructure project that would provide new transit options to the surrounding community. Alternative 1 does not include the construction of recreational facilities

or require the expansion of existing park facilities. The existing Paramount Bike Trail and Bellflower Bike Trail would be reconfigured to accommodate the Project, and access and connectivity would be maintained with the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans). The modifications would not result in adverse physical effects to the environment. As discussed in Section 4.16.5.1, several planned bike facilities would require re-categorization from Class I to Class II or Class III bicycle paths to accommodate the Project and keep the bicycle networks connected within each city. Converting the planned Class I bicycle paths into Class II or Class III bicycle paths is feasible and would maintain the connectivity identified in the bicycle master plans. However, the reclassification of the bike paths is considered an inconsistency with the current bike plans and a significant impact would occur. Alternative 1 could preempt future development and implementation of the planned Class I bicycle path along Salt Lake Avenue and planned Class I bicycle path north of Rayo Avenue and south of the Los Angeles River, discussed in Section 4.16.3.2.

Metro continues to coordinate with jurisdictions and local agencies so that Alternative 1 would not preempt future development, goals, and plans within each jurisdiction. Under Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro would continue to coordinate with jurisdictions and local agencies to minimize the preemption of future development, goals, and plans within each jurisdiction. As part of this effort, Metro, as appropriate, would prepare amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. As such, despite Metro's best efforts and coordination and with the implementation of mitigation, Alternative 1 may still preempt future development and the implementation of the planned bike paths, and limit access to bicycle facilities. Thus, impacts to bike facilities would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans).

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Similar to Alternative 1, Alternative 2 does not include the construction of recreational facilities or require the expansion of existing park facilities. Alternative 2 would require the same changes to the Paramount Bike Trail and Bellflower Bike Trail as discussed for Alternative 1 and would not result in adverse physical effects or prevent access to the bike facilities with the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans). Alternative 2 would also require changes to existing and planned bike facilities in the Cities of Huntington Park, Bell, Cudahy, and South Gate that could also preempt future development of future bike paths and result in adverse effects to the bicycle facilities. With the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. As such, Alternative 2 may result in adverse physical effects, preempt future development and implementation of planned bike paths, and limit access to bicycle facilities. Thus, impacts to bike facilities would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans).

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Alternative 3: Slauson/A Line (Blue) to Pioneer Station

Alternative 3 does not include the construction of recreational facilities or require the expansion of existing park facilities. Alternative 3 would require the same changes to the Paramount Bike Trail and Bellflower Bike Trail as discussed for Alternatives 1 and 2 and would not result in adverse physical effects or prevent access to the bike facilities with the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans). Alternative 3 would also require changes to existing and planned bike facilities in the Cities of Huntington Park, Bell, Cudahy, and South Gate that could also preempt future development of future bike paths and result in adverse effects to the bicycle facilities. With the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. As such,, Alternative 3 may preempt future development and implementation of a bike path, and limit access to bicycle facilities. Thus, impacts to bike facilities would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans).

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Alternative 4: I-105/C (Green) Line to Pioneer Station

Alternative 4 does not include the construction of recreational facilities or require the expansion of existing park facilities. Alternative 4 would require the same changes to the Paramount Bike Trail and Bellflower Bike Trail as discussed for Alternatives 1, 2, and 3 and would not result in adverse physical effects or prevent access to the bike facilities with the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans). Alternative 4 would also require changes to existing and planned bike facilities in the cities of South Gate, Bellflower, and Paramount that could also preempt future development of future bike paths and result in adverse effects to the bicycle facilities. With the implementation of Mitigation Measure LU-1 (Consistency with Bike Plans), as described in Section 4.1.4 of the Land Use Section, Metro, as appropriate, would support preparation of amended language for each affected bicycle plan demonstrating that planned bicycle facilities could still achieve an individual city's mobility and connectivity goals. However, because the process to amend bike plans is a local process, including public participation, the ultimate outcome and resolution of plan elements cannot be predicted. As such, with implementation of mitigation, Alternative 4 may preempt future development and implementation of a bike path, and limit access to bicycle facilities. Thus, impacts to bike facilities would be significant and unavoidable.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans).

Impacts Remaining After Mitigation: Significant and unavoidable impact.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Design Options 1 and 2 would be an underground station and does not include the construction of

recreational facilities or require the expansion of existing recreational facilities. Therefore, impacts would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Paramount MSF Site Option: The Paramount MSF site option is a support facility and would provide maintenance and storage services to the Project. The Paramount MSF site option does not include the construction of recreational facilities or require the expansion of existing recreational facilities. Therefore, impacts would be less than significant.

Bellflower MSF Site Option: The Bellflower MSF site option is a support facility and would provide maintenance and storage services to the Project. The Bellflower MSF site option does not include the construction of recreational facilities or require the expansion of existing recreational facilities. The Bellflower MSF site option site is city-owned, designated as Open Space by the City of Bellflower, and currently leased by the City for use as a recreational commercial business and is not a public parkland or recreational facility.

Changes to the Bellflower Bike Trail segment from Lakewood Boulevard south to Clark Avenue and implementation of Mitigation Measure LU-1 (Consistency with Bike Plans) would maintain access and connection between the bike facilities. Modifications to the bike trail would not result adverse physical effects, and access to and from the community would be maintained; therefore, impacts would be less than significant.

Mitigation Measures: Mitigation Measure LU-1 (Consistency with Bike Plans).

Impacts Remaining After Mitigation: Less than significant.

4.17 Economic and Fiscal Impacts

Operation of the Project would generate economic activity in the Study Area and the greater Los Angeles metropolitan region. During operation, the Project would provide employees, residents, and visitors an additional transportation link to employment and visitor destinations in LA County. Additional information on economic and fiscal impacts is provided in the *West Santa Ana Branch Transit Corridor Project Final Economic and Fiscal Impact Analysis Report* (Metro 2021r), included as Appendix CC of this Draft EIS/EIR.

4.17.1 Regulatory Setting and Methodology

4.17.1.1 Regulatory Setting

While there are no specific laws or executive orders that regulate the topic of economic impacts, the economics analysis used federal, state, and local guidance to prepare this report, as described below.

Federal

The following federal documents provided guidance for conducting the economic and fiscal impact analysis:

- Federal Highway Administration Technical Advisory 6640.8A (1987): This guidance document states that the economic impact analysis should include a discussion of the local and regional impacts of each alternative related to economic development, tax revenue impacts, and employment opportunities. The analysis should also discuss the impacts to local businesses and business districts and the opportunity to minimize or reduce potential impacts.

- Federal Transit Administration, Social and Economic Impacts (2016): Transit projects may have economic impacts that should be included in the environmental documentation process. Impacts discussed may include business displacements, disruptions to business activities, and impacts to the regional economy.
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970: The Uniform Relocation Act (Public Law 91-646) provides important protections and assistance for people affected by federally funded projects. This law was enacted by Congress to ensure that people whose real property is acquired, or who move as a result of projects receiving federal funds, will be treated fairly and equitably and will receive assistance in moving from the property they occupy.

State

- CEQA: According to CEQA, economic effects of a project shall not be treated as significant effects on the environment. However, economic effects of the Project may be considered to determine the significance of the physical changes caused by the Project (see *CEQA Guidelines*, § 15064(e)).
- California Relocation Assistance Act: The California Relocation Assistance Act (Government Code § 7260 et seq.) establishes uniform policies to provide for the fair and equitable treatment of people displaced from their homes or businesses as a direct result of state and/or local government projects or programs. This Act requires that comparable replacement housing be made available to displaced persons within a reasonable period of time prior to the displacement.

Local

SCAG defines the regional planning principles for the corridor, while local municipalities define economic policies for specific areas within their jurisdictional boundaries. Refer to the *West Santa Ana Branch Transit Corridor Project Final Land Use Impact Analysis Report* (Metro 2021a), included as Appendix E of this Draft EIS/EIR, for additional information.

4.17.1.2 Methodology

NEPA requires a discussion of economic and fiscal effects. No specific laws or executive orders specify the impact criteria and thresholds of economic impacts. The methodology for the evaluation of impacts to economics involved an analysis of existing data related to population, employment, tax revenues, development, and an assessment of whether the Project would adversely impact the regional economy. The environmental impact analyses presented in this section focus on the economic and fiscal effects of parcel acquisitions that could occur under the various alternatives and resulting loss in tax revenue and jobs. The economic and fiscal analysis also considers the indirect and induced economic effects and benefits due to the expenditure of funds to construct the proposed alternatives. To assess and determine the extent of potential economic effects, demographic, economic, LA County Assessor valuation, property tax, construction cost, and land use data were examined. Operational impacts have the potential to create new jobs and income, impact property values and development, and improve regional mobility and connectivity. Additional information on the methodology used for the economics and fiscal analysis is provided in the Economic and Fiscal Impact Analysis Report (Appendix CC).

Under CEQA, economic changes resulting from a project shall not be treated as having significant effects on the environment unless the economic change(s) are used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic effects on people, those adverse effects may be used as a factor in determining whether the change is significant (CEQA § 15064(e)).

4.17.2 Affected Environment/Existing Conditions

The Project is located in one of the country's largest metropolitan areas and passes through or in close proximity to approximately 20 different cities, including the City of Los Angeles. The project alignment traverses up to 12 jurisdictions: the Cities of Los Angeles, Vernon, Huntington Park, Bell, Cudahy, South Gate, Downey, Paramount, Bellflower, Artesia, and Cerritos, as well as portions of unincorporated LA County. For economics, the Affected Area is defined as a 0.25-mile area on both sides of the proposed alignment and a 0.50-mile area around the proposed station areas.

When possible, data are presented for the Affected Area for economics, but some economic or fiscal data are presented at the city or regional level when data for the smaller project area were not available or are not appropriate.

4.17.2.1 Population, Housing, and Employment

Table 4.17.1 shows population, housing, and employment data for the Affected Area for economics in the Base Year (2017) and Forecast Year (2042). As shown in the table, population, households, and employment are largest for the longer alignments (Alternatives 1 and 2) and smallest for the shortest alignment (Alternative 4). Densely populated neighborhoods, major employment centers, and other key regional destinations where future growth is forecasted to occur are located in the northern sections of Alternatives 1 and 2. Neighborhoods in Central City Los Angeles, Central City North Los Angeles, and Southeast Los Angeles are expected to experience some of the greatest percentage growth in population and households along the corridor over the analysis period. The higher end of the range in employment reflects the employment centers that would be served in the Downtown Transit Core by Alternative 2. Section 4.1 of the *West Santa Ana Branch Transit Corridor Project Final Communities and Neighborhoods Impact Analysis Report* (Metro 2021n), included as Appendix G of this Draft EIS/EIR, provides additional information.

Table 4.22.2 in Section 4.22 in the Environmental Justice Section of this Draft EIS/EIR provides the percentages of the populations in Study Area jurisdictions that are racial/ethnic minorities and/or are living in poverty. According to the U.S. Census Bureau (2018), employment in the Affected Area for economics is concentrated in the education, health care, and manufacturing sectors, representing 34 percent of all jobs. Other large employers in the area include the retail trade (12 percent); arts, entertainment, recreation, accommodation, and food service (11 percent); and professional services (10 percent). These sectors are strong sources of employment in LA County as a whole, which has a slightly higher percentage of jobs in the education and health care sector and a lower percentage of jobs in manufacturing when compared to the Affected Area for economics. Section 4.1 of the Economic and Fiscal Impact Analysis Report (Appendix CC) provides additional information.

Table 4.17.1. Study Area Population, Housing, and Employment, 2017 and 2042

	Item	Alternative 1: LAUS to Pioneer Station	Alternative 2: 7th Street/Metro Center to Pioneer Station	Alternative 3: Slauson/ A (Blue) Line to Pioneer Station	Alternative 4: I-105/C (Green) Line to Pioneer Station
	Length (miles)	19.3	19.3	14.8	6.6
Population	Year 2017	181,981	185,152	151,111	63,905
	Year 2042	290,901	323,795	240,580	103,624
	Average Annual Growth	1.9%	2.3%	1.9%	2.0%
Households	Year 2017	49,830	59,399	39,338	18,084
	Year 2042	82,933	109,578	63,721	30,006
	Average Annual Growth	2.1%	2.5%	1.9%	2.0%
Employment	Year 2017	95,225	154,207	37,937	18,842
	Year 2042	126,067	192,285	46,430	22,586
	Average Annual Growth	1.1%	0.9%	0.8%	0.7%

Source: Metro 2021n
Note: LAUS = Los Angeles Union Station

4.17.2.2 Local Government Tax Revenues

City and county governments rely on tax revenues to fund general services to their respective communities. The Project could affect property tax and retail sales revenues for jurisdictions in the Affected Area for economics. For the State of California, voter-approved Proposition 13 set the property tax rate at 1 percent of assessed value. The 1 percent is shared by all taxing agencies whose districts include the property location, such as cities, school districts, fire departments/districts, and LA County. All cities in the Affected Area for economics except Cudahy receive a portion of the basic levy to fund government services. The rate varies for each city.

Table 4.17.2 shows tax revenues and the percent of total general fund tax revenues represented by property tax revenues for each city within the proposed corridor in the most recent year available. Property taxes represented 7 to 46 percent of total tax revenue. Approximately 41 percent of all taxes are included as "Other Taxes" in Table 4.17.2; "Other Taxes" may include transient occupancy taxes, utility taxes, business license taxes, and other taxes for which the source is not specified.

Table 4.17.2. Local Government Tax Revenues (2018)

City	Property Taxes	Sales Tax	Other Taxes	Total General Fund Tax Revenue	Property Tax as Percent of Total Tax Revenue
Los Angeles	$2,058,761,000	$557,990,000	$1,891,958,000	$4,508,709,000	46
Vernon	$17,270,355	$7,177,884	$23,974,390	$48,422,629	36
Huntington Park	$1,069,127	$11,686,353	$6,134,065	$18,889,545	6
Bell	$4,411,848	$2,360,400	$4,311,800	$11,084,048	40
Cudahy	$265,030	$1,270,000	$1,097,000	$2,632,030	10
South Gate	$12,314,651	$21,126,054	$4,928,819	$38,369,524	32
Downey	$25,996,994	$25,796,994	$12,218,000	$64,011,988	41
Paramount	$2,265,000	$7,800,000	$6,649,250	$16,714,250	14
Bellflower	$11,032,000	$6,172,000	$7,659,500	$24,863,500	44
Artesia	$2,444,466	$2,695,000	$1,153,381	$6,292,847	39
Cerritos	$3,125,000	$34,577,500	$5,188,900	$42,891,400	7
Total	$2,139,056,655	$674,109,538	$1,965,289,040	$4,778,455,233	45

Sources: City of Artesia 2018; City of Bell 2018b; City of Bellflower 2018; City of Cerritos 2018a; City of Cudahy 2018b; City of Downey 2018; City of Huntington Park 2018; City of Los Angeles 2018a; City of Paramount 2018; City of South Gate 2018; City of Vernon 2018
Note: Revenues reported do not include revenue sources such as license fees, fees for service, interest income, or other miscellaneous non-tax revenues.

4.17.2.3 Existing Land Use

The improved mobility and connectivity provided by stations could be one of many factors that influence new development or redevelopment of vacant or under-utilized properties near the proposed stations. Transportation investment may provide opportunities for TOD. This development may also serve as a catalyst for public and private economic revitalization that could provide economic benefits and enhanced quality of life to communities.

One of the critical components of TOD is supportive policies, including land use policies that encourage economic development around transit stations. These policies incentivize revitalization of underutilized or vacant parcels, encourage new housing near transit centers, support pedestrian and bike facilities, and preserve or expand access to open spaces and recreation. SCAG reports (2012a) that "all jurisdictions within the Project's Study Area have one or more plans guiding future development around proposed stations."

Table 4.1.2 in Section 4.1.2.1 in the Land Use Section of this EIS/EIR provides station location information and surrounding land uses for the Build Alternatives and design options. Additional information on land use policies is provided in the Economic and Fiscal Impact Analysis Report (Appendix CC) and the Communities and Neighborhoods Impact Analysis Report (Appendix G).

Table 4.17-3 provides proposed station location information for Alternatives 1 and 2, including the surrounding land uses currently in place. Design Option 1 would construct a station behind the MWD building and east of LAUS as opposed to the LAUS Forecourt. Design Option 2 would construct a station in the Little Tokyo neighborhood that would provide service to a densely populated area with connection to the Regional Connector.

Table 4.17-3. Existing Land Use Near Proposed Stations

City	Proposed Station	Current Station Area Land Use
Los Angeles	Alternative 1: LAUS Forecourt Alternative 1 or 2: Arts/Industrial District Alternative 2: 7th Street/Metro Center Alternative 1: Design Option 1 (MWD) Alternative 2: Design Option (Little Tokyo 2)	Industrial, commercial, and manufacturing; civic; transit hub; residential; tourist destinations
LA County	Slauson/A Line (adjacent to existing Metro A [Blue] Line Slauson Station)	Industrial, commercial, and residential; civic; open space
Huntington Park	Pacific/Randolph Florence/Salt Lake	Industrial, commercial, and low-scale residential; civic; open spaces
South Gate	Firestone I-105/C Line (adjacent to the proposed Metro C [Green] Line Station)	Industrial; Azalea Shopping Center; residential; high-traffic and train movements
Downey	Gardendale	Health care (Rancho Los Amigos); commercial; residential
Paramount	Paramount/Rosecrans	Residential; adjacent to commercial and civic uses
Bellflower	Bellflower	Neighborhoods; residential; commercial and mixed use
Artesia	Pioneer	Industrial; mixed commercial; residential

Sources: SCAG 2012b; Metro 2015b
Note: I- = Interstate; LA = Los Angeles; LAUS = Los Angeles Union Station

The existing land use near proposed stations for Alternative 3 would be similar to those described in Table 4.17-3 and would be limited to the corridor between the Slauson/A Line Station to the north and the Pioneer Station to the south. Proposed stations for Alternative 4 would be similar to those described in Table 4.17-3 and would be limited to the corridor between the I-105/C Line Station to the north and Pioneer Station to the south.

4.17.3 Environmental Consequences/Environmental Impacts

4.17.3.1 No Build Alternative

The No Build Alternative includes existing transportation networks and transportation improvements that have been committed to and identified in constrained plans of the Metro 2009 LRTP (Metro 2009a) and the SCAG 2016 RTP/SCS (SCAG 2016a). Table 2.2 in Chapter 2 of this Draft EIS/EIR lists the projects anticipated by 2042. Planned projects would be subject to separate environmental analysis to evaluate economic and fiscal impacts. Implementation of these projects, including operations and maintenance, would be subject to regulatory standards, conditions, and permitting requirements. Compliance with these standards would minimize economic impacts. Residual impacts are expected to be minor. Therefore, under NEPA, the No Build Alternative would not result in adverse effects related to economic and fiscal effects.

4.17.3.2 Build Alternatives

This section describes the potential impacts of the Build Alternatives, including the project alignment, design options, and MSFs, with corridor-wide application. The approach to analyze the impacts of the Build Alternatives on the different topics discussed in this section are similar for each alternative and the potential impacts are summarized together. The relative impacts of the Build Alternatives are presented in each topic area. More details about the Build Alternatives' effects on economic and fiscal impacts may be found in the Economics and Fiscal Impacts Analysis Report (Appendix CC). Discussions across the following economic and fiscal elements are evaluated in the following subsections:

- Operational Impacts on Employment
- Long-Term Impacts on Property Values
- Regional Mobility and Connectivity
- Impacts on Local Tax Bases
- Direct Employment Impacts from Displacements

Operational Impacts on Employment

The Project would create long-term jobs and additional earnings as a result of operating and maintenance (O&M) expenditures. The benefits of operating and maintaining the light rail system include providing a range of employment opportunities at living wages. The additional household earnings would result in an increase in positive economic activity to the local economy, both through direct hiring to fill transit jobs and indirectly as these transit workers spend their earnings, thus creating additional consumer demand and jobs to meet that demand.

Annual costs for each alignment were estimated in the *West Santa Ana Branch Transit Corridor Project Final Operating and Maintenance Costs Report* (Metro 2021w), included as Appendix Q of this Draft EIS/EIR, and are shown in Table 4.17-4. Total O&M costs are expected to be nearly the same for Alternatives 1 and 2 at approximately $88 million per year (2020 dollars). Additional estimates were developed for Alternative 2 that include costs associated with operating short-line service during peak travel times to the Slauson/A Line Station that added $5 to $13 million per year. Total wages and benefits are estimated to be 44 to 48 percent of total operating expenses. Wages and benefits from operation of the new alignment would range between $42 and $45 million annually in 2020 dollars, depending on the alternative selected. Alternatives 3 and 4 have shorter alignments with fewer stations. Annual operating expenses are estimated to be $67 million for Alternative 3 and $41 million for Alternative 4.

The overall impact of the additional O&M jobs on the regional economy would depend on the source of funding for the workers. While the Build Alternatives would create new jobs associated with operating and maintaining the new light rail facility, most of the funding would come from state and local sources that are considered economic transfers within the region and would not result in new economic activity. In 2016, Metro received assistance from the federal government in the form of grants to fund approximately 10 percent of total operations (Metro 2017f). It is assumed that Metro would continue to receive similar levels of federal assistance to fund operations of the Project; thus, the additional jobs created through operational activities would have a net benefit on regional economic activity and, under NEPA, the Build Alternatives would not result in adverse effects related to operational employment.

Table 4.17-4. Summary of Economic Impacts during Project Operation

Item	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Operating Expenditure (2020 dollars):	$87,605,512	$100,903,752	$67,482,952	$40,526,831
Percent of New Money[1]	10	10	10	10
Additional Operating Expenditure funded by New Federal Money	$8,760,551	$10,090,375	$6,748,295	$4,052,683
Final-demand Multiplier: Output	2.3162	2.3162	2.3162	2.3162
Final-demand Multiplier: Earnings	0.7502	0.7502	0.7502	0.7502
Final-demand Multiplier: Jobs per $1 Million Spent	27.9529	27.9529	27.9529	27.9529
Regional Impacts: Output	$20,291,189	$23,371,327	$15,630,401	$9,386,825
Regional Impacts: Earnings	$6,572,166	$7,569,799	$5,062,571	$3,040,323
Regional Impacts: Employment (person-year jobs)[2]	245	282	189	113

Source: Bureau of Economic Analysis 2017; Metro 2021w
Notes: [1] Percent of new money is the percent of total operation and maintenance expenses funded through federal funding sources that otherwise would not have been introduced into the regional economy.
[2] A job is defined as one job for one person for one year.
Alternative 2 costs include costs associated with operating short-line service during peak travel times to the Slauson/A Line Station.

To estimate the regional impacts associated with the Project, Regional Input-Output Modeling System (RIMS) II final-demand multipliers from the Bureau of Economic Analysis for the transit and ground transportation industry were applied to the amount of new funding that would be used for operating expenses (Bureau of Economic Analysis 2017). Multipliers for the greater Los Angeles area were used. The results of this analysis are summarized in Table 4.17-4.

The operational spending effects associated with the Project would result in an estimated $9.4 to $23.4 million in overall economic activity per year. The economic activity includes direct and indirect activity. It is estimated that operation-related spending would provide regional economic benefits by generating $3.0 to $7.6 million in additional wages and salaries for households and by creating 113 to 282 person-year jobs for all industries in the region per year. A person-year job is defined as one job for one person for one year. Based on the predicted regional economic benefits from both direct and indirect sources, the potential impacts would be beneficial and, under NEPA, the Build Alternatives would not result in adverse effects related to operational employment.

Long-Term Impacts on Property Values

The Build Alternatives are expected to indirectly lead to new development and/or redevelopment of land surrounding some of the proposed light rail stations, which would likely have the effect of increasing property tax revenues for the affected local jurisdictions. While development is

regulated by the affected jurisdictions and is driven by regional and local economic conditions, light rail lines can advance the timing and increase the intensity of development, within the limits allowed by local zoning, particularly surrounding proposed station areas.

Research on the impacts associated with light rail systems indicates that light rail is one of many factors that can influence development. A study conducted by the U.S. Government Accountability Office (Wise 2014) identified key conditions that support TOD, including the following:

- Market demand for real estate
- Large parcels of land available for development
- Resident support for TOD
- Efficient access to jobs and centers of activity
- Local government support of TOD

Many communities along the Build Alternatives' corridor are subject to local municipal policies that are or will be in place in the future to support TODs. The Build Alternatives would serve residents in a densely populated area located in economic and cultural activity centers, which is expected to attract continued investment in the area. The added investment would likely result in increased property values for businesses and residences near station areas. However, some properties located next to the alignments for the Build Alternatives would likely have some reduction in value because of the nuisance effects associated with the Project. The *West Santa Ana Branch Transit Corridor Project* Final *Noise and Vibration Impact Analysis Report* (Metro 2021j), included as Appendix M of this Draft EIS/EIR, identifies properties that would experience noise impacts. Mitigation measures such as sound walls would help minimize and mitigate some of the impacts. Overall, the potential for increased property values and new development near station areas would likely offset any value reductions and would provide greater benefits to businesses and residences in the Affected Area for economics as well as increased property tax revenues benefiting the local jurisdictions. The net impact would likely be beneficial for the region and, under NEPA, the Build Alternatives would not result in adverse effects related to long-term impacts on property values.

Policies that encourage TOD, such as general plan updates for the Cities of Huntington Park and South Gate, will encourage development near station areas that should increase the property tax base for communities along the corridor. Overall potential impacts to property values are anticipated to have a net benefit to the regional economy. More details about the project effects on property values are provided in the Economic and Fiscal Impact Analysis Report (Appendix CC).

Regional Mobility and Connectivity

Operation of the Build Alternatives would provide a number of economic benefits to businesses, employees, and residents in the area. Each of the design options would have the following beneficial impacts to the regional economy:

- Businesses would benefit from increased access to a broader labor market with a diverse set of skills that is served by the Project.
- Potential employees who are transit-dependent would have access to a larger labor market, which may provide greater economic opportunities.
- Businesses located near stations may experience an increase in retail sales as riders travel to and from the station area.
- Some public transportation passengers may experience a reduction in vehicle ownership costs as they switch from driving to public transportation.

- Some areas may experience a reduction in congestion, which could lead to travel-time savings for businesses and individuals.
- The transit network would have improved connectivity, with more connections to LAUS and the existing Metro A (Blue), B (Red), C (Green), D (Purple), and L (Gold) Lines.
- Future travel demand would be accommodated, including the high number of transit trips made by Study Area residents.
- The densely populated neighborhoods, major employment centers, and other key regional destinations where future growth is forecasted to occur within the Study Area would have improved access.

The Build Alternatives would have impacts on local businesses as local traffic patterns are changed, patronage to new stations is introduced, and the off-street and on-street parking in the corridor changes (the result of reductions from construction and operations, along with focused increases at the five new station parking facilities: Firestone Station, I-105/C Line Station, Paramount/Rosecrans Station, Bellflower Station, and Pioneer Station). Even with the new station parking facilities, these changes introduced by the Build Alternatives could result in a loss of overall parking for some businesses (refer to the *West Santa Ana Branch Transit Corridor Project Final Transportation Impact Analysis Report* [Metro 2021s], included as Appendix D of this Draft EIS/EIR) and could cause impacts to mobility and connectivity. Some businesses may experience a loss in revenue if potential customers are discouraged from patronizing the business because of real or perceived inconvenience. The implementation of Mitigation Measure TRA-22 (Parking Mitigation Program) would reclaim some of the lost parking for customers, which could reduce adverse effects of lost revenue.

Other factors may positively affect business revenues, including increased exposure to customers in and around the station areas or higher visibility along the light rail alignment.

Impacts on Local Tax Bases

For the Build Alternatives, Metro would need to acquire residential and commercial properties, as well as property owned by local cities and other government agencies, within the corridor. Parcels are either full acquisitions, partial acquisitions, temporary construction easements, or public agency right-of-way. Property owned by public agencies is tax exempt and therefore does not generate property tax revenues. More details about the affected properties are provided in the *West Santa Ana Branch Transit Corridor Project Final Displacements and Acquisitions Impact Analysis Report* (Metro 2021m), included as Appendix H of this Draft EIS/EIR).

When referring to the property tax impacts of acquisitions, the term "initial property tax impacts" is used because the extent of the long-term fiscal impact of the system is uncertain. Initially, property taxes would no longer be collected from full or partial acquisitions along the route. As a result, the rates charged remaining taxpayers would increase slightly to recover budgeted funds, or budgets for essential government services would be reduced accordingly.

Table 4.17.5 presents the initial property tax impact estimates by city for the Build Alternatives. The property tax impact presented in this section focuses on the impact to each city's general fund collections. The tax effects of the Build Alternatives are estimated to be a decrease of between approximately 0.0 and 0.5 percent of the budgeted general fund property tax collections in 2018 for affected cities.

Table 4.17.5. Initial Property Tax Impact by City

City	2018 Property Tax Revenue	Initial Property Tax Impacts				Potential Impact to General Fund Revenues			
		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Los Angeles	$2,058,761,000	$151,134	$190,672	$9,250	$0	0.01%	0.01%	0.00%	0.00%
Vernon	$17,270,355	$26	$26	$26	$0	0.00%	0.00%	0.00%	0.00%
Huntington Park	$1,170,311	$6,642	$6,642	$6,642	$0	0.57%	0.57%	0.57%	0.00%
Bell	$4,411,848	$0	$0	$0	$0	0.00%	0.00%	0.00%	0.00%
Cudahy	$265,030	$0	$0	$0	$0	0.00%	0.00%	0.00%	0.00%
South Gate	$12,314,651	$11,345	$11,345	$11,345	$4,550	0.09%	0.09%	0.09%	0.04%
Downey	$25,996,994	$0	$0	$0	$0	0.00%	0.00%	0.00%	0.00%
Paramount	$2,265,000	$9,289	$9,289	$9,289	$9,289	0.41%	0.41%	0.41%	0.41%
Bellflower	$11,032,000	$2,866	$2,866	$2,866	$2,866	0.03%	0.03%	0.03%	0.03%
Artesia	$2,444,466	$5,364	$5,364	$5,364	$5,364	0.22%	0.22%	0.22%	0.22%
Cerritos	$3,125,000	$0	$0	$0	$0	0.00%	0.00%	0.00%	0.00%

Sources: Metro 2021m; LA County 2019b

Between 7 to 46 percent of the tax revenues collected by affected cities are from property taxes (Table 4.17.2). The remaining revenues come from other tax sources (for example, sales and use, business and occupation, utility, and other). Similar to property tax impacts, the long-run tax impacts to local jurisdictions from these other taxes are uncertain and depend on whether displaced businesses relocate within the same community. Businesses unable or unwilling to relocate within the same community would represent a loss of revenues to the local jurisdiction. These types of losses would be offset to the extent that business activity increases and/or new businesses are attracted to the area. Local jurisdictions are likely to receive substantial sales tax revenues from purchases related to project construction. In addition to funding local jurisdiction programs, total property tax levies include funds collected for consolidated county taxes, fire prevention, libraries, schools, and other services. Based on the Build Alternatives' conceptual designs, the initial property tax impacts from acquisitions are, in all cases, less than 0.5 percent of the total general fund property tax revenues collected by cities in the project alignment.

As discussed in the Long-Term Impacts on Property Values Section, many communities along the corridor have plans for TOD near proposed stations. However, this development would be subject to approval by the city and to all applicable requirements and regulations of the affected city. This would result in new construction, which is added to the jurisdiction's tax base, thus increasing the revenue available to a jurisdiction for essential government services. Thus, the long-term property tax impacts are uncertain but are likely to be lower than the initial property tax impacts. Therefore, under NEPA, the Build Alternatives would not result in adverse effects related to local tax bases. More details about the Build Alternatives' effects on property taxes are provided in the Economic and Fiscal Impact Analysis Report (Appendix CC).

Direct Employment Impacts from Displacements

Table 4.17.6 provides estimates of the numbers of businesses and employees located at properties that would be acquired for the Build Alternatives. The estimates were prepared based on field verification of addresses and business names obtained from the Displacements and Acquisitions Impact Analysis Report (Appendix H). Employment was estimated using employee-per-square-foot ratios for a small number of parcels for which information from the other sources was not available.

Table 4.17.6. Business and Employee Displacement

Alternative	Number of Businesses	Estimated Number of Employees
Alternative 1: LAUS to Pioneer Station	89	601
Alternative 2: 7th Street/Metro Center to Pioneer Station	108	687
Alternative 3: Slauson/A (Blue) Line to Pioneer Station	65	352
Alternative 4: I-105/C (Green) Line to Pioneer Station	18	115
Paramount MSF	5	113
Bellflower MSF	2	75

Source: Metro 2021m
Note: LAUS = Los Angeles Union Station; MSF = maintenance and storage facility

The magnitude of the business displacement impact is described by comparing the number of employees displaced to total employment in the areas surrounding the proposed light rail line in Table 4.17.7. The second and third columns compare 2017 and 2042 employment forecasts for neighborhoods surrounding the Affected Area for economics. The estimates are based on SCAG regional projections. Data for the segments are defined as a collection of traffic analysis zones (TAZ) located within 0.25 mile of the rail line and 0.50 mile of proposed stations. TAZ are the system used in travel demand forecasting. Columns four and five provide the cumulative annual average growth rate for each option and the implied number of employees added from 2017 to 2018, which is an estimate of one year's underlying growth in employment in the project area. The final column represents an estimate of the number of employees at businesses that would be displaced by the Project.

Table 4.17.7. Relative Impact of Displaced Employees

Alternative	2017 Employment	2042 Employment	Cumulative Annual Growth		Employees (Jobs) Displaced
			Percent	Jobs	
Alternative 1: LAUS to Pioneer Station	95,225	126,067	1.1	1,075	601
Alternative 2: 7th Street/Metro Center to Pioneer Station	154,207	192,285	0.9	1,367	687
Alternative 3: Slauson/A (Blue) Line to Pioneer Station	37,937	46,430	0.8	308	352
Alternative 4: I-105/C (Green) Line to Pioneer Station	18,842	22,586	0.7	137	115
Paramount MSF	18,842	22,586	0.7	137	113
Bellflower MSF	18,842	22,586	0.7	137	75

Source: Metro 2021m
Notes: LAUS = Los Angeles Union Station; MSF = maintenance and storage facility

Except for Alternative 3, the projected employment growth from 2017 to 2042 in the Affected Area for economics is expected to be greater than the jobs displaced by the Project. Employees in a variety of industrial businesses represent approximately 40 percent of potentially impacted employment across the Build Alternatives. Other industries that are affected by the Build Alternatives include retail and automotive services. Metro would provide relocation assistance to impacted employers; therefore, it is likely that the displaced jobs would be relocated, not lost.

According to the Displacements and Acquisition Impact Analysis Report (Appendix H) prepared for the Build Alternatives, the supply of currently available replacement sites within a 6-mile radius is sufficient to relocate nearly all displaced businesses. Because the Project would provide relocation assistance to displaced businesses and employees, it is likely that some of the displaced jobs would be relocated, not lost. However, some businesses may find it difficult to relocate to a new neighborhood within the project area and may decide to close or move farther away, resulting in the loss of jobs in the immediate area. The Hollywood Sports Park is one specific business that may have difficulty finding suitable replacement property in the project area. Additionally, some employees may find commuting to a relocated business expensive or inconvenient and decide not to relocate with their place of employment. Some displaced employees may be able to find new jobs through the relocation

effort. Overall, the potential employment impacts from business displacements are not expected to be substantial. The potential for direct and induced employment associated with the Project is also expected to add employment opportunities to the local and regional economy. Therefore, under NEPA, the Build Alternatives would not result in adverse effects related to displaced businesses as a result of the Project.

4.17.3.3 Design Options—Alternative 1

The design options are substantially similar to the Build Alternatives with regard to property values, potential impacts, and effect determinations.

Design Option 1: LAUS at MWD: The Design Option 1 station box would be located behind the MWD building and east of LAUS as opposed to the LAUS Forecourt. Effects from this design option to regional connectivity, property tax revenues, and displacements would be similar to those under Alternative 1.

Design Option 2: Add Little Tokyo Station: Design Option 2 would increase connectivity to the regional transportation system because the alignment would have direct access to the Regional Connector. The potential new development that may occur with TOD would also be realized. Potential impacts to displaced businesses or employees would be similar because the optional station is expected to displace one additional business and no residents. If Little Tokyo Station were constructed, Alternative 1 would have a slightly larger fiscal impact to the City of Los Angeles. The conclusions and effect determinations on property values provided for the Build Alternatives would also be applicable to the design option.

4.17.3.4 Maintenance and Storage Facility

The proposed MSFs in either Bellflower or Paramount would provide additional employment opportunities in the region. The employment estimates discussed above for the Build Alternatives would include new jobs during operations at either of these facilities. The conclusions and effect determinations provided for the Build Alternatives would also be applicable to the MSF site options.

Paramount MSF Site Option

The Paramount MSF site option would require acquisition of a large parcel that is home to the Paramount Swap Meet and the Paramount Drive-In Theatre. A cellular service provider also has a retail store on the site. The initial property tax impacts are estimated to be approximately 0.6 percent of the general fund property tax collections (Table 4.17.8) and are not expected to result in a measurable change to property taxes. Therefore, under NEPA, the Paramount MSF site option would not result in adverse effects related to the local city's tax-based revenues.

Table 4.17.8. Initial Property Tax Impact by Jurisdiction – Paramount MSF

Jurisdiction	2018 Property Tax Revenue	Initial Property Tax Impacts	Potential Impact to General Fund Revenues
Paramount	$2,265,000	$13,069	0.6%

Source: Metro 2021m
Note: MSF = maintenance and storage facility

The Paramount MSF would displace 5 businesses and 113 employees. Because the Project would provide relocation assistance to displaced businesses and employees, it is likely that some of the displaced jobs would be relocated, not lost. However, some businesses such as the swap meet and the drive-in may find it difficult to relocate to a new neighborhood and may decide to close, therefore resulting in the loss of jobs in the immediate area. Overall, the potential employment impacts from business displacements would not be substantial. Therefore, under NEPA, the Paramount MSF site option would not result in adverse effects related to employment in the region.

The Paramount MSF site option would generate lower noise levels than existing conditions (see Table 5.7 in the Noise and Vibration Impact Analysis Report [Appendix M). Therefore, under NEPA, the Paramount MSF site option would not result in adverse effects related to land use types and proximities because nuisance effects that could impact property values are expected to be minimal.

Bellflower MSF Site Option

The Bellflower MSF site option would be on a property owned by the City of Bellflower and leased to the Hollywood Sports Paintball & Airsoft Park and Bellflower BMX. Given that this property is owned by the City of Bellflower, it is exempt from paying property taxes. Therefore, under NEPA, the Bellflower MSF site option would not result in adverse effects related to property tax impacts.

The Bellflower MSF would displace 2 businesses (Hollywood Sports Paintball & Airsoft Park and Bellflower BMX) and approximately 75 employees. Because the Project would provide relocation assistance to displaced businesses and employees, it is likely that some of the displaced jobs would be relocated, not lost. However, some businesses, such as the sports park, may find it difficult to relocate to a new neighborhood and may decide to close, resulting in the loss of jobs in the immediate area. Overall, the potential employment impacts from business displacements would not be substantial. Therefore, under NEPA, the Bellflower MSF site option would not result in adverse effects related to employment in the region.

Land uses surrounding the site include single-family and multifamily residential, industrial and commercial, and recreational. The Bellflower MSF site option would not involve any roadway/intersection closures or turning restrictions that would restrict access to nearby residential communities. There are no noise impacts associated with the MSF. Nuisance impacts related to access restrictions or noise are not expected to result in adverse effects on property values.

4.17.4 Project Measures and Mitigation Measures

No project or mitigation measures would be required for the Build Alternatives, including design options and MSF site options.

4.17.5 California Environmental Quality Act Determination

The CEQA determination presented in the following subsections is based on a comparison of the existing conditions described in Section 4.17.2 and the environmental impacts analysis presented in Section 4.17.3. The following subsections are applicable to the Affected Area for economics, the Build Alternatives, the design options, and the MSF site options.

Under CEQA, economic changes resulting from a project shall not be treated as significant effects on the environment unless the economic change(s) are used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic effects on people, those adverse effects may be used as a factor to determine whether the physical change is significant (CEQA § 15064).

While CEQA does not specify economic thresholds to be analyzed, the following questions are presented as relevant economic issues to be considered under *CEQA Guidelines* and to determine if significant impacts would result from implementation of the Build Alternatives.

4.17.5.1 Would the project result in substantial impacts to regional mobility and connectivity?

No Project Alternative

Under the No Project Alternative, the Build Alternatives would be introduced, thereby resulting in no changes to the Affected Area for economics regarding regional mobility and connectivity. Residents, employees, and visitors in the Affected Area for economics would not have the benefit of the interconnected transportation network provided by the Build Alternatives. However, the absence of these potential benefits does not rise to the level of, nor constitute, a significant impact. Therefore, operation-related impacts would be less than significant, and mitigation would not be required.

Build Alternatives

As discussed in Section 4.17.3.2, operation of the Project would have beneficial economic and fiscal impacts by improving transit accessibility and mobility, enhancing regional connectivity, and reducing travel time and costs in the region. These improvements would likely encourage greater economic activity and would benefit businesses and commuting employees. No impacts to regional mobility or connectivity are anticipated.

Alternative 1: Los Angeles Union Station to Pioneer Station

Operation of Alternative 1 would have beneficial economic and fiscal impacts by improving transit accessibility and mobility, enhancing regional connectivity, and reducing travel time and costs in the region. Alternative 1 would provide additional access to LAUS and connections to the larger regional network. This would likely encourage greater economic activity and would benefit businesses and commuting employees. The operation of the Project would also increase employment and tax revenue, which would benefit local and regional economies. Therefore, operation-related impacts would be beneficial, resulting in less than significant impacts, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternative 2 is substantially similar to Alternative 1 in regard to mobility and connectivity impacts associated with new light rail alignment. Alternative 2 would provide improved connections to the downtown employment center but would not connect to LAUS. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 2. Therefore, operation-related impacts would not occur under Alternative 2, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Within its geographic limits, Alternative 3 would have similar benefits for regional mobility and connectivity, as described previously; however, the benefits to the region would be less than the benefits under Alternatives 1 and 2 because Alternative 3 would not include as many stations (nine stations) and would not provide additional transit options to densely populated areas in northern Los Angeles neighborhoods, such as the Arts District or Little Tokyo. The exclusion of these three stations would result in less access to the regional labor market for those dependent on transit. However, Alternative 3 would still have a net benefit to regional connectivity, Therefore, operation-related impacts for Alternative 3 would be less than significant, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

The benefits to the region would be less under Alternative 4 than the benefits under the other Build Alternatives because Alternative 4 would not include as many stations (four stations) and would not provide additional transit options to densely populated areas in Los Angeles and other cities to the north, resulting in less access to the regional labor market for those dependent on transit. However, Alternative 4 would still have a net benefit to regional connectivity. Therefore, operation-related impacts for Alternative 4 would be less than significant, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Design Option 1 would have similar impacts as Alternative 1. Design Option 2 would construct a new underground station in Little Tokyo and would increase connectivity to the regional transportation system as the alignment would have direct access to the Regional Connector. Each of the design options would still have a net benefit to regional connectivity. Therefore, operation-related impacts for Design Options 1 and 2 would be less than significant, and mitigation would not be required.

Maintenance and Storage Facility

Neither of the MSF site options are expected to impact regional connectivity or mobility. No mitigation would be required.

4.18 Safety and Security

This section summarizes the existing safety and security measures used by Metro in the Affected Area for safety and security and considers the effects on safety and security from operation of the Project. System safety refers to the prevention of accidents to transit passengers, employees, or others present at or adjacent to Metro transit facilities, which includes stations, tracks, pedestrian walkways, TPSSs, and trains. Security relates to protection of people from intentional acts that could result in injury or harm and protection of property from deliberate acts. This includes crime prevention, law enforcement, and protection against terrorism.

Greater detail on safety and security is provided in the *West Santa Ana Branch Transit Corridor Project Final Safety and Security Impact Analysis Report* (Metro 2021c), included as Appendix F of this Draft EIS/EIR).

4.18.1 Regulatory Setting and Methodology

4.18.1.1 Regulatory Setting

Federal

The following federal regulations regarding safety and security are applicable this Project:

- Public Transportation Agency Safety Plan (49 CFR. Part 673)
- CFR Title 28, Part 36, Americans with Disabilities Act)

State

In California, the CPUC has been identified as the state safety oversight agency. The following CPUC General Orders (GOs) regarding safety and security are applicable to the Project:

- GO 88-B
- GO 164-E
- GO 143-B

Safety and security regulations from the CCR, CBC, and Caltrans are also applicable to this Project.

Regional

Metro is responsible for compliance with all FTA and CPUC regulations governing the safe operation of its transit systems, both for patrons and employees. The following Metro safety and security policies are applicable to this Project:

- Metro Grade Crossing Policy for Light Rail Transit (Metro 2010a)
- Metro Emergency Response Plan Policy (Metro 2010b)
- Metro Rail Design Criteria (Metro 2020h)
- Metro Fire/Life Safety Design Criteria (Metro 2010d)
- Homeless Task Force

In addition to Metro, the LACDPW *Standard Plans Manual* (LACDPW 2000) applies to design improvements within county right-of-way. The *Los Angeles County General Plan 2035* (Los Angeles County Department of Regional Planning 2015) includes policies that affect police and fire services in the Affected Area for emergency service.

Local

The project corridor traverses the following 12 local jurisdictions (listed from north to south):

- Los Angeles
- Vernon
- Huntington Park
- Bell
- Cudahy
- South Gate
- Downey
- Paramount
- Bellflower
- Artesia

- Cerritos
- Unincorporated Florence-Firestone community of Los Angeles County

As such, the Project would also be subject to the applicable General Plan policies and objectives within each jurisdiction (see Table 3.1, General Plan Goals and Policies Relating to Safety and Security, in the Safety and Security Impact Analysis Report [Appendix F]).

4.18.1.2 Methodology

NEPA requires that the federal government use all practicable means for Americans to have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 USC 4331(b)(2)). NEPA does not include specific guidance or direction with respect to evaluating alternatives and relative effects of alternatives on public safety and security. The NEPA analysis considers potential adverse environmental impacts, including whether a project or a design option would result in unacceptable safety, security, or operational problems.

Similarly, one aim of CEQA is that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions. Appendix G of the *CEQA Guidelines* (14 CCR, Section 15000 et seq.), suggests agencies consider whether a project will substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses or whether the project would result in inadequate emergency access. The Appendix G *CEQA Guidelines* are included in Section 4.18.5.

For purposes of the qualitative assessment for safety and security, the Affected Area for emergency response services is defined as the larger Study Area, encompassing the 2-mile buffer along the 19-mile corridor. The Affected Area for safety and security is defined as the area within 100 feet of the Project and its components (e.g., TPSSs). The Affected Area for emergency service was determined based on the service area of hospital, fire, and police services. The Affected Area for safety and security was determined based on safety of users and crime prevention within the immediately adjacent area of the Build Alternatives. The following elements were considered in the qualitative analysis within the Affected Area for safety and security: current safety and security conditions as they relate to pedestrians, bicyclists, LRT passengers and employees; existing emergency services (police, fire, and ambulance); available crime and security statistics; and other relevant data for the Affected Area. For each element within the Affected Area for safety and security, the analysis evaluated compliance with regulations and policies, the existing conditions, and design features and project measures to determine the environmental impacts and mitigation measures.

4.18.2 Affected Environment/Existing Conditions

4.18.2.1 Transit System Safety

For the safety of passengers and the public, Metro operates all transit-related vehicles according to the guidelines established by the CPUC. Regulations established by the CPUC for light rail vehicles (LRVs) include requirements for rearview mirrors, audible warning devices, and grab handles for standing passengers. The CPUC also regulates LRVs' braking, lighting, and operating speeds (GO 143-B). As a result of compliance with these regulations, Metro has a proven track record in safety, with only two derailments for over 120 million vehicle revenue miles since 2008, according to the National Transit Database (2017). Additionally, Metro has established a variety of programs to inform rail users and nonusers alike about proper safety precautions around operating transit vehicles and transit stations.

4.18.2.2 Pedestrian, Bicyclist, and Motorist Safety

The pedestrian circulation system within the Affected Area for safety and security consists of sidewalks, crosswalks, street lighting, and street furniture. The pedestrian circulation system is generally well developed and complete, serving the surrounding land uses. The majority of the intersections are signalized and have crosswalks with pedestrian indicators and push-button activation for pedestrian phases. Most intersections in the Affected Area for safety and security allow pedestrian crossings along all four sides.

Metro is continually working to improve vehicular and pedestrian safety along its current rail lines and has implemented several programs (such as the Rail Safety Orientation Tour Program and the Rail Safety Education Program) to educate rail users and nonusers about safety precautions near transit vehicles and facilities. The latest statistics for accidents between trains/automobiles and trains/pedestrians for Metro's rail lines during the four quarters of Fiscal Year 2020 are presented in Table 4.18.1.

Table 4.18.1. Metro Rail Line Fiscal Year 2020 Train/Vehicle and Train/Pedestrian Accidents

Metro Rail Line	FY20 Q1	FY20 Q2	FY20 Q3	FY20 Q4
A (Blue) Line	2	7	0	0
B/D (Red/Purple) Line	0	0	0	0
C (Green) Line	0	0	0	0
L (Gold) Line	2	1	0	0
E (Expo) Line	4	5	0	0

Source: Metro 2021c
Note: FY = fiscal year; Q = quarter

4.18.2.3 Security

The affected environment with respect to security involves the existing bus and rail system, including stations, vehicles, and ancillary facilities, and the areas in the immediate vicinity of those facilities. Passengers, transit employees, vendors, contractors, and members of the general public who come in contact with the system, as well as transit property and equipment, would be susceptible to the same crimes they might experience in the surrounding neighborhoods. Metro implements internal security features for its bus and rail system, including closed circuit television cameras (CCTV), emergency call boxes, fully lighted station stops, bicycle parking, and transit parking areas. These features, which are on the trains and buses or at the rail stations, are designed to offer security and a sense of personal well-being for patrons and passengers.

4.18.2.4 Freight Railroad

Several subdivisions and branches of existing railroads with active freight operations are within the Affected Area for safety and security; some would share ROW with the Build Alternatives. The FRA defines shared ROW as two or more rail services operating on separate parallel tracks having track centerline separation of less than 30 feet. Separation of 30 feet or less triggers the application of certain FRA safety regulations. The Build Alternatives would

share ROW with freight along the Wilmington Branch, La Habra Branch, San Pedro Subdivision, and PEROW corridors, shown in Figure 3-18 in Chapter 3.

4.18.2.5 Fire Protection

Various fire departments provide fire and emergency response services throughout the Affected Area for emergency service. These fire departments, including the Los Angeles Fire Department, the Los Angeles County Fire Department, Vernon Fire Department, and Downey Fire Department, would provide first response in case of an accident. Figure 4.18-1 shows fire stations within the Affected Area for emergency service. Additional details on the existing fire protection services within the Affected Area for emergency service are provided in the Safety and Security Impact Analysis Report (Appendix F).

4.18.2.6 Police Protection

The Los Angeles County Sheriff's Department (LACSD) Transit Services Bureau (TSB), the Los Angeles Police Department (LAPD), and the Long Beach Police Department (LBPD) provide contract police services to Metro. Deputies provide police services for the heavy rail, light rail, and bus transportation systems throughout Metro's 1,433-square-mile service area. The TSB, LAPD, and LBPD provide security patrols for the Metro LRT system. TSB personnel are also deployed for fare compliance and patrolled security for fixed assets. Figure 4.18-1 shows the locations of police stations within the Affected Area for emergency service. Additional details on the existing police and security services within the Affected Area for emergency service are provided in the Safety and Security Impact Analysis Report (Appendix F).

4.18.2.7 Emergency Medical Services

A number of hospitals currently serves the Affected Area for emergency service. These hospitals are available to assist in the event that emergency medical response services are needed. The locations of the hospitals are shown on Figure 4.18-1. Additional details on the existing emergency medical services within the Affected Area for emergency service are provided in the Safety and Security Impact Analysis Report (Appendix F).

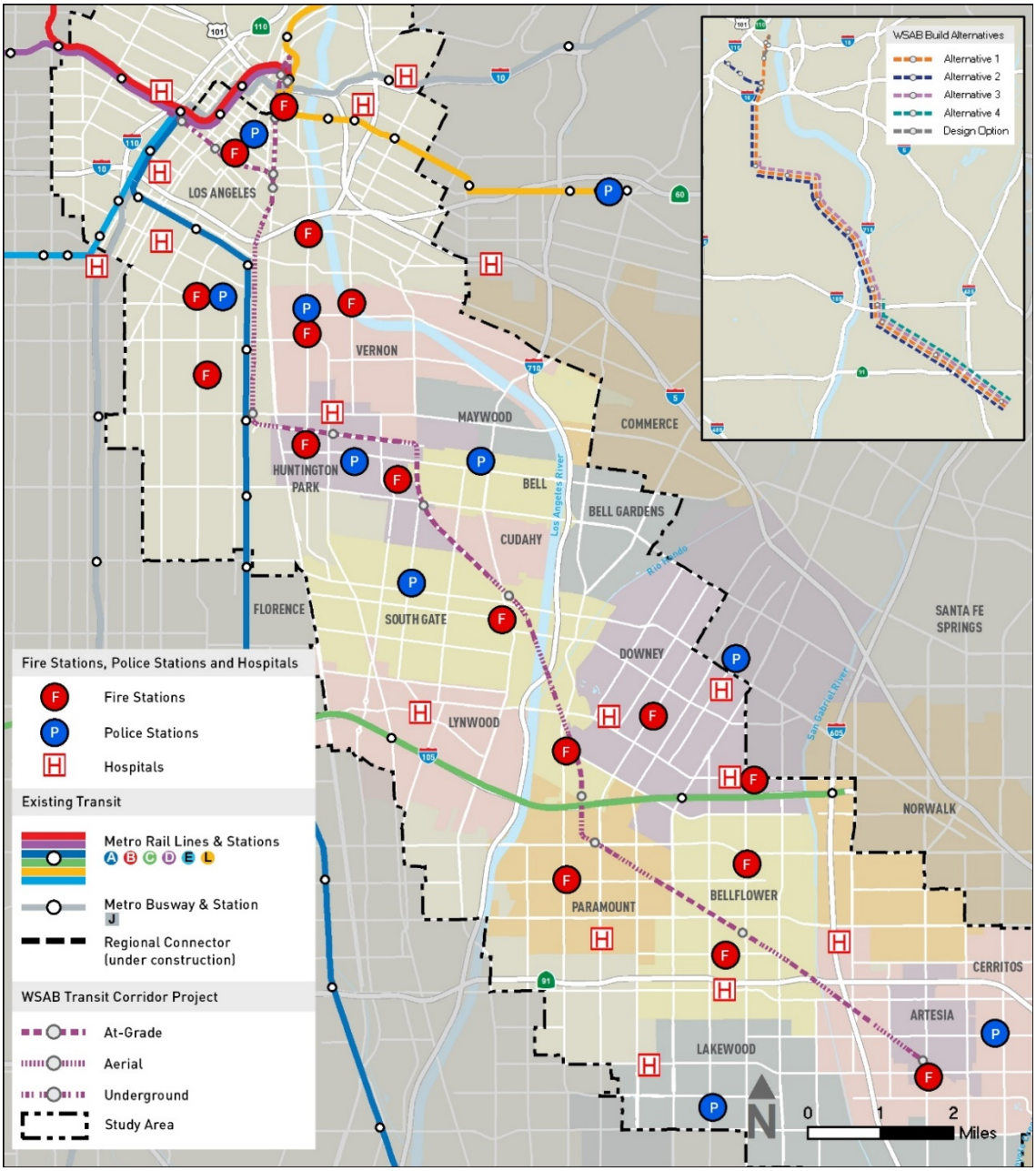
4.18.3 Environmental Consequences/Environmental Impacts

This section summarizes the environmental impacts of the No Build and Build Alternatives as they relate to safety and security and the methodology used to evaluate these impacts. More details about the Build Alternatives' effects on safety and security are included in the Safety and Security Impact Analysis Report (Appendix F).

4.18.3.1 No Build Alternative

As discussed in Chapter 2, Section 2.5.1, No Build Alternative, the No Build Alternative includes capital transportation improvements and/or transit and highway operational enhancements in the Affected Area for both safety and security, as well as emergency services, that are reasonably foreseeable. These include Metro service features that currently exist or projects that have been explicitly committed for buildout by the year 2042. Implementation of these projects, including operations and maintenance, would be subject to the regulatory standards, conditions, and permitting requirements discussed in Section 4.18.1 (e.g., FTA, FRA, CPUC, MRDC; Metro 2020h]). Compliance with these standards would minimize impacts to safety and security. Impacts, if any, are expected to be minor and not adverse. Maintenance and operation of the projects included in the No Build Alternative would be subject to environmental clearance.

Figure 4.18-1. Fire Stations, Police Stations, and Hospitals within the Affected Area for Emergency Service



Source: Metro 2021c

4.18.3.2 Alternative 1: Los Angeles Union Station to Pioneer Station

Transit and Freight System Safety

Transit system safety focuses on identifying, eliminating, and/or controlling safety hazards related to Alternative 1's systems and equipment, including signaling, traction power, overhead catenary system, stations, alignment, track, and communication. The potential for safety hazards such as collisions, service interruption, property damage, injuries, or fatalities may occur as a result of the malfunction or misuse of these systems and equipment.

Alternative 1 would be designed and constructed in accordance with the referenced regulations, standards, and policies identified in Section 4.18.1. All facilities and equipment would be designed to provide for the safety and security of passengers and employees. The following would be implemented to identify and minimize safety hazards during preliminary engineering and final design of Alternative 1:

- Safety and Security Certification Plan
- System Safety Program Plan
- Threat and Vulnerability Assessment (TVA)
- Preliminary Hazards Assessment (PHA)
- Establishment of a Fire/Life Safety Committee to meet with the design team and review fire protection measures and requirements, and other safety hazards

Metro has established operating procedures in the case of a seismic event during operation. Alternative 1 would meet the required structural design standards and building codes to minimize the potential hazards of a seismic event.

With implementation of these plans, assessments, and committee, Alternative 1 would be designed such that there would not be adverse transit system safety impacts during revenue service operations. Alternative 1 would be operated in accordance with Metro system safety plans, policies, and procedures or equivalent, such as: Metro System Safety Program Plan, Metro System Security Plan, Metro Standard and Emergency Operating Procedures, and the Metro Rail Operating Rulebook.

Alternative 1 would operate in 11.4 miles of shared ROW with freight operations along the following corridors:

- Wilmington Branch: Approximately 1.8 miles of shared ROW with freight operations
- La Habra Branch: Approximately 2.3 miles of shared ROW with freight operations
- San Pedro Subdivision: Approximately 6.1 miles of shared ROW with freight operations
- PEROW: Approximately 1.2 miles of shared ROW with freight operations

Both the Wilmington Branch and La Habra Branch are owned and operated by UPRR. The San Pedro Subdivision is owned by the Ports of Los Angeles and Long Beach and operated by UPRR. The PEROW is owned by Metro, but a short segment between the San Pedro Subdivision and Somerset Boulevard along the PEROW is operated by BNSF Railway to serve the World Energy facility. Shared ROW with freight operations would introduce the potential for a derailment or a collision between the trains that could cause service interruptions, equipment damage, and/or harm to passengers and employees. This situation currently exists on the Metro A (Blue) Line along the Wilmington Branch, where it shares ROW with freight operations. To date, there have not been any collisions between the Metro A (Blue) Line and freight operations.

To avoid derailments, Alternative 1 would be designed in accordance with FRA and Metro standards and criteria, including the following:

- Appropriate track spacing distance between freight and Alternative 1
- Protective fencing and barriers installed where appropriate
- An intrusion detection system to detect an intrusion into the ROW

- Communication protocols established between the railroad and Metro to quickly respond to derailment emergencies
- Emergency responder training and drills to respond to derailment emergencies

As part of the project development process and pursuant to FTA Circular 5800.1 – Safety and Security Management Guidance for Major Capital Projects requirements, Metro would conduct a TVA and create a Fire/Life Safety committee for the Project. The TVA and the committee would review Alternative 1 and verify countermeasures to increase safety and reduce the potential of collisions during subsequent design phases.

While these safety features and processes would minimize impacts, there would still be an adverse effect due to the potential for derailment and collision. Under NEPA, Alternative 1 would result in adverse effects related to safety and security prior to the implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), which would detect potential derailments that may occur on Metro ROW. With implementation of this mitigation measure, impacts would be minimized and there would not be an adverse effect to the safety of passengers, employees, and the public from the shared ROW with freight operation. After implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), Alternative 1 would not result in adverse effects related to safety and security.

Motorist, Pedestrian, and Bicyclist Safety

At-grade crossings of Alternative 1 would introduce the potential for collisions and potential hazards to motorist safety. North of Randolph Street, Alternative 1 is either underground or in an aerial configuration. Alternative 1 would result in 34 at-grade crossings south of Randolph Street, which would introduce the potential for conflicts between LRVs and motor vehicles. The potential for impacts would be minimized because Alternative 1 would: follow the Manual of Uniform Traffic Control Devices (MUTCD) standards, observe all applicable traffic laws, implement and follow CPUC and local safety requirements, and incorporate design features such as signs and markings, flashing light signals, gates and traffic-control signals, pathway grade crossings, illumination, and safety barriers. There would be no adverse effects related to motorist safety and collisions, and mitigation measures are not required.

Pedestrian and bicycle safety during operation of Alternative 1 would consider safety along the alignment, at station locations, at designated crossings, and at proposed parking facilities. Pedestrian safety issues would mostly apply to proposed at-grade stations and less to the proposed underground and aerial LRT facilities, as underground and aerial stations can be designed to avoid these concerns. Additionally, the underground and aerial stations would avoid potential conflicts between pedestrians/bicyclists and motor vehicles that would occur with the at-grade stations.

Alternative 1 would be operated in accordance with Metro system safety plans, policies, and procedures and would provide for the safety of those riding within the LRV and for pedestrians and bicyclists along the guideway and at stations. Pedestrian and bicycle safety is prioritized through Metro's *Grade Crossing Policy for Light Rail Transit* (2010a), providing a method for determining whether proposed grade crossings should be grade-separated or at-grade. The review process begins with an initial screening during the feasibility study, which initially categorizes roadway crossings into "at-grade should be feasible," "possible at-grade operation," and "grade separation usually required." The initial analysis has been completed and further information on the grade crossing analysis specific to Alternative 1 and the other Build Alternatives can be found in the *West Santa Ana Branch Grade Crossing Analysis Step 1 Technical*

Report (Metro 2017i). In addition, in compliance with CPUC regulations (CPUC GOs 88-B and 164-D), Metro would prepare and submit grade crossing design applications and conduct grade crossing diagnostics. Based on the CPUC review of grade crossing applications and diagnostics, additional safety and security design features would be incorporated, if necessary.

Although the grade crossing analysis will determine the grade separations, there would be no changes to the determination of safety impacts for both the at-grade and grade-separated crossings. LRT systems operate safely and successfully in both at-grade and grade-separated configurations in cities across California and North America.

Alternative 1 would also be operated in conjunction with Metro's *First/Last Mile Strategic Plan* (2014b), which would incorporate pedestrian and bicycle safety improvements. Examples of first/last mile safety improvements include bike lanes, sidewalks, crosswalks, signage and wayfinding, and information and technology that eases travel.

Alternative 1 would follow Metro's latest Rail Operating Rulebook and CPUC regulations, which allow LRV operators to use audible warning devices to alert pedestrians and bicyclists that an LRV is approaching. Pedestrian and bicycle traffic control and channelization techniques (e.g., crossing gates and ROW barriers) would be used to direct pedestrian and bicycle movements at-grade crossings and to encourage the use of designated crossings. Signage would be posted at these locations to provide safety information and awareness.

Alternative 1 would comply with all applicable regulations and the MRDC or equivalent. In addition, the PHA and TVA would be prepared during preliminary engineering and final design stages of the Project to verify hazards and features for enhanced pedestrian and bicyclist safety, such as pavement markings and signs. The analysis will verify illumination levels and sight distance improvements as necessary. This analysis is required by FTA and SAF PM-5 (Certification and Approval).

Table 4.18.2 provides a qualitative evaluation of safety and security conditions for pedestrians and bicyclists. Elements evaluated include traffic safety, access/accessibility, sight visibility, lighting, and urban design, and considers both the existing conditions of the Affected Area for safety and security and the proposed project features. Each element was given a rating of either "Poor," "Fair," or "Good," and a rating of "N/A" was given for any element not applicable for any of the specific segments evaluated. A "Poor" rating is defined as a higher risk safety and security condition and should consider potential improvements. A "Fair" rating is defined as an adequate safety and security condition, where potential improvements could be considered, as needed. A "Good" rating is defined as a low risk safety and security condition, where no improvements are needed for pedestrian and bicyclist safety.

Table 4.18.3 provides a qualitative assessment of safety and security conditions and potential issues for pedestrians and bicyclists at each proposed parking facility. The assessment identified station and guideway locations as "Good" and Fair" and would not result in adverse effects. The assessment considered analysis from the *West Santa Ana Branch Transit Corridor Project Transportation Impact Analysis Report* (Metro 2021s) and *Pacific Electric ROW/West Santa Ana Branch Transit Corridor Project Urban Design Report* (SCAG 2012b).

Based on this analysis, Alternative 1 would provide a safe and secure environment for Metro patrons, pedestrians, and bicyclists. For further details on the information presented, refer to the Safety and Security Impact Analysis Report (Appendix F).

Table 4.18.2. Summary of Pedestrians and Bicyclists Safety Assessment for the Build Alternatives

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
1	Los Angeles	Union Station (Forecourt)	Station	Underground	**GOOD** No issues; future Los Angeles Union Station Forecourt and Esplanade project will further enhance safety	**GOOD** No issues; future Los Angeles Union Station Forecourt and Esplanade project will further enhance access and accessibility	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Historic building with no issues
	Los Angeles	Union Station (MWD [Design Option 1])	Station	Underground	**GOOD** No issues; future Los Angeles Union Station Forecourt and Esplanade project will further enhance safety	No issues; future Los Angeles Union Station Forecourt and Esplanade project will further enhance access and accessibility	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Historic building with no issues
	Los Angeles	Union Station to Little Tokyo	Guideway	Underground	N/A	N/A	N/A	N/A	N/A

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
	Los Angeles	Little Tokyo (Optional, added with Design Option 2)	Station	Underground	**GOOD** Existing signalized intersections with crosswalks; future Eastside Access Improvements project will further enhance safety	**GOOD** No issues; future Eastside Access Improvements project will further enhance access and accessibility	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** No issues
	Los Angeles	Little Tokyo to Arts/Industrial District	Guideway	Underground	N/A	N/A	N/A	N/A	N/A
2	Los Angeles	7th/Metro Center	Station	Underground	**GOOD** Existing signalized intersections with crosswalks	**GOOD** Existing wide sidewalks	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** No issues
	Los Angeles	7th/Metro Center to South Park/Fashion District	Guideway	Underground	N/A	N/A	N/A	N/A	N/A

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
	Los Angeles	South Park/Fashion District	Station	Underground	**GOOD** Existing signalized intersections with crosswalks and protected bikeway	**GOOD** Existing wide sidewalks	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** No issues
	Los Angeles	South Park/Fashion District to Arts/Industrial District	Guideway	Underground	N/A	N/A	N/A	N/A	N/A
1 and 2	Los Angeles	Arts/Industrial District	Station	Underground	**GOOD** Existing signalized intersections with crosswalks	**GOOD** Existing wide sidewalks	**GOOD** No issues	**GOOD** Area is well-lit	**FAIR** Industrial with no issues
	Los Angeles, Unincorporated LA County	Arts/Industrial District to Slauson	Guideway	Underground, Aerial	N/A	N/A	**GOOD** No issues	**FAIR** Area is adequately lit	**GOOD** Residential and commercial with no issues
1, 2, and 3	Unincorporated LA County	Slauson	Station	Aerial	**FAIR** Future Rail to Rail project will enhance traffic safety	**FAIR** Future Rail to Rail project will enhance traffic safety	**GOOD** No issues	**FAIR** Area is adequately lit	**FAIR** Industrial setting; future Rail to Rail project will enhance urban design

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
	Unincorporated LA County, Huntington Park	Slauson to Pacific/Randolph	Guideway	Aerial, At-Grade	**GOOD** Travel lane reduction and crosswalk improvements	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Huntington Park	Pacific/Randolph	Station	At-Grade	**GOOD** Travel lane reduction and crosswalk improvements	**GOOD** Sidewalk and curb ramp improvement	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Huntington Park, Bell	Pacific/Randolph to Florence/Salt Lake	Guideway	At-Grade, Aerial	**GOOD** Travel lane reduction and crosswalk improvements	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Huntington Park	Florence/Salt Lake	Station	At-Grade	**GOOD** Signalized intersection with crosswalk improvements	**GOOD** Sidewalk and curb ramp improvement	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Huntington Park, Cudahy, South Gate	Florence/Salt Lake to Firestone	Guideway	At-Grade, Aerial	**GOOD** Crossing gates and existing signalized intersections with crosswalk	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
	South Gate	Firestone **[P]**	Station	Aerial	**FAIR** Crossing gates and existing signalized intersections with crosswalk with new driveway	**FAIR** Sidewalk and curb ramps at specific locations	**FAIR** Station is located behind several buildings, but sight visibility is adequate from aerial station	**FAIR** Project provides lighting	**FAIR** Industrial with no issues
	South Gate, Downey	Firestone to Gardendale	Guideway	Aerial, At-Grade	**GOOD** Crossing gates and existing signalized intersections with crosswalk	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Downey,	Gardendale	Station	At-Grade	**GOOD** Signalized intersection with crosswalk improvements	**GOOD** Sidewalk and curb ramp improvement	**GOOD** No issues	**GOOD** Project provides lighting	**FAIR** Industrial with no issues
	Downey, South Gate	Gardendale to I-105/C Line	Guideway	At-Grade	**GOOD** Crossing gates and existing signalized intersections with crosswalk	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**FAIR** Industrial with no issues

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
1, 2, 3, and 4	South Gate	I-105/C Line **[P]**	Station	At-Grade	**GOOD** Crossing gates and crosswalk	**GOOD** Curb ramps, pedestrian walkway from C Line station, direct access from parking facility	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and industrial with no issues
	South Gate, Paramount	I-105/C Line to Paramount/Rose crans	Guideway	At-Grade, Aerial	N/A	N/A	N/A	N/A	**GOOD** Residential and industrial with no issues
	Paramount	Paramount/Rose crans **[P]**	Station	Aerial	**GOOD** Existing signalized intersections with crosswalks	**GOOD** Direct access from parking facility	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Paramount, Bellflower	Paramount/Rose crans to Bellflower	Guideway	Aerial, At-Grade	**GOOD** Crossing gates and existing signalized intersections with crosswalk	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues

Alternative	City	Segment	Type	Configuration	Traffic Safety	Access/ Accessibility	Sight Visibility	Lighting	Urban Design
	Bellflower	Bellflower **[P]**	Station	At-Grade	**GOOD** Crossing gates and existing signalized intersections with crosswalks	**GOOD** New curb ramps	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Bellflower, Cerritos, Artesia	Bellflower to Pioneer	Guideway	At-Grade, Aerial	**GOOD** Crossing gates and existing signalized intersections with crosswalks	N/A	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues
	Artesia	Pioneer **[P]**	Station	At-Grade	**GOOD** Crossing gates and existing signalized intersections with crosswalks	**GOOD** Direct access from parking facility	**GOOD** No issues	**GOOD** Area is well-lit	**GOOD** Residential and commercial with no issues

Source: Metro 2021c
Note: MWD = Metropolitan Water District; N/A = not applicable; [P] = Proposed Station Parking

Table 4.18.3. Safety Summary for Proposed Parking Facilities

Parking Facility	Location	Proposed Parking Spaces	Parking Facility Safety Description	Potential Issues	Design Features
Firestone Station (Alternatives 1, 2, and 3)	South Gate	▪ 600 parking spaces	At-grade crossings (includes freight crossing at each) from parking facility to the Firestone aerial station. Parking facility has direct connection to station.	▪ Pedestrians need to cross freight tracks to access station.	▪ Controlled pedestrian crossing gates with warning lights and signs between plaza level and parking facility.
I-105/C Line Station (Alternatives 1, 2, 3, and 4)	South Gate	▪ 326 parking spaces	Path of travel for passengers transferring between C (Green) Line and Build Alternatives would require pedestrian movement crossing over Century Boulevard. Total distance of travel is approximately 0.1 mile.	▪ To access the station from the parking lot to the west of the station, patrons would have to cross freight track crossings. ▪ Potential for pedestrian and automobile interface accessing the station as pedestrians cross Century Boulevard.	▪ Controlled pedestrian crossing gates with warning lights and signs, crosswalks, and signage at the Century Street at-grade crossing separating the two stations for the C (Green) Line and Build Alternatives.

Parking Facility	Location	Proposed Parking Spaces	Parking Facility Safety Description	Potential Issues	Design Features
Paramount/ Rosecrans Station (Alternatives 1, 2, 3, and 4)	Paramount	▪ 490 parking spaces	Parking facility has direct connection to station. Direct connection path of travel from the parking facility to the station would require movement of pedestrians underneath transmission towers or via sidewalk along Paramount Boulevard.	▪ No safety issues.	▪ Dedicated pedestrian walkway from parking facility to plaza level.
Bellflower Station (Alternatives 1, 2, 3, and 4)	Bellflower	▪ 263 parking spaces	The path of travel requires crossing tracks to access station. Parking facility has direct connection to station.	▪ No safety issues.	▪ Pedestrian crossing with swing gates and warning signage.
Pioneer Station (Alternatives 1, 2, 3, and 4)	Artesia	▪ 1,100 parking spaces	Path of travel from the parking facility requires pedestrian movement along 187th Street or Pioneer Boulevard. Total distance of travel is less than approximately 0.1 mile.	▪ No safety issues.	▪ Pedestrian walkway from parking facility to sidewalk along 187th Street and Pioneer Boulevard. Includes pedestrian crossing gates and signage.

Source: Metro 2021c

To minimize potential hazards, traffic-control improvements and wayfinding features (e.g., signage, pavement markings) would be implemented to provide safe passage at station parking facilities and reduce potential conflicts between vehicles and the pedestrians/ bicyclists traveling between the parking facility and the station entrances. Under NEPA, Alternative 1 would not result in adverse effects related to safety and security, and mitigation would not be required.

Emergency Response Services

Potential impacts on emergency response services would occur if Alternative 1 were to interfere with local jurisdictions' emergency response plans or delay emergency service providers. Delays could occur as a result of gate downtimes at the at-grade crossings. Other potential impacts could include modifications to emergency preparedness and planning, changes in the ability to provide fast and efficient response to emergencies or disasters, and the broader ability to minimize risk to the safety and health of passengers, employees, and emergency response personnel.

Metro would coordinate with involved fire and police departments in addressing fire/life safety and security for the proposed alignment, parking facilities, and station areas within their respective jurisdictions. A comprehensive Emergency Preparedness Plan (EPP) that can be integrated with emergency service providers, local jurisdictional emergency response plans, and Metro's existing emergency procedures would be developed for operation of Alternative 1, as required by FTA. Metro, in coordination with local jurisdictions, would develop traffic management plans to reduce delays in response times for emergency service providers. Gate operations at at-grade crossings would be configured per CPUC standards as part of Alternative 1 and the traffic mitigation measures.

The previously described coordination and operational requirements would minimize the potential impacts to emergency service providers and response times. Under NEPA, Alternative 1 would not result in adverse effects related to safety and security, and mitigation would not be required.

Security and Prevention of Crime and Terrorism

Security relates to protection of people from intentional acts that could result in injury or harm, and protection of property from deliberate acts of vandalism. This includes crime prevention, law enforcement, and protection against terrorism. Terrorism is defined by the Homeland Security Act of 2002 as acts that are dangerous to human life or potentially destructive of critical infrastructure or key resources.

To help prevent crime and terrorist activity, Metro contracts with law enforcement personnel from LACSD, LAPD, and LBPD on the transit system during hours of operation (see Section 4.18.2.6). Metro and contracted law enforcement would employ an ongoing assessment of security at all station areas for appropriate redeployment of law enforcement and security services. In addition, Metro's TSB is deployed for fare compliance and patrolled security for fixed assets. The multi-agency law enforcement in the Metro system allows local jurisdictions to be positioned for active and timely response to emergency calls. Metro's policing contracts provide consistent and reliable staffing of approximately 314 law enforcement officers per 24-hour period. It also includes dedicated service and proactive security patrols and provides flexibility to enhance security as the Metro transit system expands to include Alternative 1.

Alternative 1 would be designed to include security features such as lighting, surveillance, CCTV, access control, and emergency call boxes to reduce the potential for crime and terrorist activity. The TVA conducted in compliance with FTA regulations would include a response and evacuation plan. Key provisions of the TVA would include the following:

- Identify various threat scenarios that may be applicable to project assets.
- Provide a preliminary assessment of the consequences and possible effects resulting from credible criminal and terrorist threats.
- Develop a prioritized risk assessment based on potential consequences and probability.
- Verify countermeasures that are practical to implement and help improve transit system security.

Security patrols, crime prevention through environmental design (CPTED), and compliance with FTA regulations would minimize potential security concerns associated with the identified threats. Alternative 1 would be designed to address crime and terrorism. Under NEPA, Alternative 1 would not result in adverse effects related to safety and security, and mitigation would not be required.

4.18.3.3 Alternative 2: 7th Street/Metro Center to Pioneer Station

Transit and Freight System Safety

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.2 in regard to transit system safety conditions, potential impacts, and effect determinations as both alternatives terminate at underground stations adjacent to major transit hubs. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 2. Therefore, adverse effects would not occur for Alternative 2.

Alternative 2 is substantially similar to Alternative 1 in regard to freight operations, potential impacts, and effect determinations as both alternatives terminate at underground stations adjacent to major transit hubs. The conclusions and effect determinations provided for Alternative 1, as described in Section 4.18.3.2, would also be applicable to Alternative 2 and, therefore, would be substantially similar to Alternative 1. Under NEPA, Alternative 2 would result in adverse effects related to safety and security prior to the implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), which would detect potential derailments that may occur on Metro ROW. After implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), Alternative 2 would not result in adverse effects related to safety and security.

Motorist, Pedestrian, and Bicyclist Safety

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.2, in regard to motorist, pedestrian, and bicycle safety conditions, potential impacts, and effect determinations because both alternatives terminate at underground stations adjacent to major transit hubs. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 2. Under NEPA, Alternative 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

Refer to Table 4.18.2 and Table 4.18.3 for a summary of safety and security conditions relative to pedestrians and bicyclists for Alternative 2. Based on this analysis, Alternative 2 would provide a safe and secure environment for Metro patrons, pedestrians, and bicyclists. For further details on the information presented, refer to the Safety and Security Impact Analysis Report (Appendix F).

Emergency Response Services

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.2, in regard to emergency response service conditions, potential impacts, and effect determinations as both alternatives terminate at underground stations adjacent to major transit hubs. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 2. Under NEPA, Alternative 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

Security and Prevention of Crime and Terrorism

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.2 in regard to security and crime conditions, potential impacts, and effect determinations because both alternatives terminate at underground stations adjacent to major transit hubs. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 2. Under NEPA, Alternative 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

4.18.3.4 Alternative 3: Slauson/A (Blue) Line to Pioneer Station

Transit and Freight System Safety

While Alternative 3 would result in a shorter alignment and fewer stations than Alternatives 1 and 2, Alternative 3 would be substantially similar to Alternative 1 in regard to transit system safety, potential impacts, and effect determinations, as described in Section 4.18.3.2. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 3.

Alternative 3 would reduce the length of shared ROW with freight operations from 11.4 miles to 10.1 miles compared to Alternatives 1 and 2. Under Alternative 3, LRVs would share ROW with freight operations along the Wilmington Branch (0.5 mile), the PEROW (1.2 miles), the San Pedro Subdivision (6.1 miles), and the La Habra Branch (2.3 miles). Despite the reduction in miles of shared ROW with freight operations, the same freight operating conditions, potential impacts, and effect determinations for Alternative 1, as described in Section 4.18.3.2, would still exist under Alternative 3 and, therefore, would be substantially similar to the Alternative 1. Under NEPA, Alternative 3 would result in adverse effects related to safety and security prior to the implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), which would detect potential derailments that may occur on Metro ROW. After implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), Alternative 3 would not result in adverse effects related to safety and security.

Motorist, Pedestrian, and Bicyclist Safety

While Alternative 3 would result in a shorter alignment and fewer stations than Alternatives 1 and 2, the number of at-grade crossings and service frequencies would not be reduced (train headways would remain the same). Alternative 3 would be substantially similar to Alternative 1 in regard to motorist safety, potential impacts, and effect determinations, as described in Section 4.18.3.2. Therefore, Alternative 3 would have the same or slightly reduced impacts; no adverse effects on motorist safety would occur, and mitigation measures are not required.

Alternative 3 would be substantially similar to Alternative 1 in regard to pedestrian and bicycle safety, potential impacts, and effect determinations, as described in Section 4.18.3.2. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 3. However, terminus stations generally have increased pedestrian and bicycle demand that could result in higher potential for safety hazards to occur, such as crime and pedestrian safety. Under Alternative 3, Pioneer Station would remain the southern terminus; however, the northern terminus would be located at the Slauson/A Line Station instead. The Slauson/A Line Station would also continue to serve as a transfer point and would be designed to accommodate anticipated pedestrian activity. As a result of the shorter alignment, ridership demand would be approximately 60 percent lower than the other alternatives. While the reduction in ridership would change station patronage, the same safety and security conditions, potential impacts, and effect determinations would still exist at both terminus stations and, therefore, would be substantially similar to those effects identified at the termini of the other alternatives. Under NEPA, Alternative 3 would not result in adverse effects related to safety and security, and mitigation would not be required.

Refer to Table 4.18.2 and Table 4.18.3 for a summary of safety and security conditions relative to pedestrians and bicyclists for Alternative 3. Based on this analysis, Alternative 3 would provide a safe and secure environment for Metro patrons, pedestrians, and bicyclists. For further details on the information presented, refer to the Safety and Security Impact Analysis Report (Appendix F).

Emergency Response Services

Alternative 3 would result in a shorter alignment and fewer stations, as well as slightly reduce the number of affected emergency responders (for example, police, fire, and medical) than Alternatives 1 and 2. However, the conditions for the emergency response services within Alternative 3 would be substantially similar to Alternative 1. The impact conclusions related to emergency response services for Alternative 1, as described in Section 4.18.3.2, are also applicable to Alternative 3. Under NEPA, Alternative 3 would not result in adverse effects related to safety and security, and mitigation would not be required.

Security and Prevention of Crime and Terrorism

While Alternative 3 would result in a shorter alignment and fewer stations than Alternatives 1 and 2, Alternative 3 would be substantially similar to Alternative 1 in regard to security and prevention of crime and terrorism, potential impacts, and effect determinations, as described in Section 4.18.3.2. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 3. Under NEPA, Alternative 3 would not result in adverse effects related to safety and security, and mitigation would not be required.

4.18.3.5 Alternative 4: I-105/C (Green) Line to Pioneer Station

Transit and Freight System Safety

While Alternative 4 would result in a shorter alignment and fewer stations than Alternatives 1, 2, and 3, Alternative 4 would be substantially similar to Alternative 1 in regard to transit system safety, potential impacts, and effect determinations, as described in Section 4.18.3.2. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 4. Therefore, adverse effects would not occur for Alternative 4.

Alternative 4 would reduce the length of shared ROW with freight operations from 11.4 miles to 2.0 miles compared to Alternatives 1 and 2. Under Alternative 4, LRVs would share ROW with freight operations for a shorter segment (0.8 mile) within the San Pedro Branch and continue to share ROW with freight operations related to the World Energy facility along the PEROW for approximately 1.2 miles. Despite the reduction in miles of shared ROW with freight operations, the same safety and security conditions, potential impacts, and effect determinations for Alternative 1, as described in Section 4.18.3.2 would still exist under Alternative 4 and, therefore, would be substantially similar to Alternative 1. As a result, the identified impacts would still be substantial and there would be an adverse effect without mitigation because of the potential for derailment and collision as a result of the shared ROW with freight operations under Alternative 4. Under NEPA, Alternative 4 would result in adverse effects related to safety and security prior to the implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), which would detect potential derailments that may occur on Metro ROW. After implementation of Mitigation Measure SAF-1 (Encroachment Detection) (see Section 4.18.4), Alternative 4 would not result in adverse effects related to safety and security.

Motorist, Pedestrian, and Bicyclist Safety

For Alternative 4, the number of at-grade crossings would be reduced to 13 compared to 34 under Alternatives 1, 2, and 3. Service frequencies would not be reduced (train headways would remain the same) at the 13 at-grade crossing locations under Alternative 4. Nonetheless, the impact conclusions for Alternative 1 described in Section 4.18.3.2 for motorist safety and collisions are applicable to Alternative 4. Therefore, Alternative 4 would have the same or slightly reduced impacts; no adverse effects on motorist safety would occur, and mitigation measures are not required.

While Alternative 4 would result in a shorter alignment and fewer stations than Alternatives 1, 2, and 3, Alternative 4 would be substantially similar to Alternative 1 in regard to pedestrian and bicycle safety, potential impacts, and effect determinations, as described in Section 4.18.3.2. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 4. Therefore, adverse effects would not occur for Alternative 4.

However, terminus stations generally have increased pedestrian and bicycle demand that may result in greater potential for safety hazards to occur, such as crime and general pedestrian safety. Under Alternative 4, Pioneer Station would remain the southern terminus; however, the northern terminus would be located at the I-105/C Line Station instead. The I-105/C Line Station would also continue to serve as a transfer point and would be designed to accommodate anticipated pedestrian activity. As a result of the shorter alignment, ridership demand would be approximately 85 percent lower than the other alternatives. While this reduction in ridership would change station patronage, the same safety and security

conditions, potential impacts, and effect determinations would still exist at both terminus stations and would therefore be substantially similar to those effects identified at the termini of the other alternatives described above. Under NEPA, Alternative 4 would not result in adverse effects related to safety and security, and mitigation would not be required.

Refer to Table 4.18.2 and Table 4.18.3 for a summary of safety and security conditions relative to pedestrians and bicyclists for Alternative 4. Elements evaluated include traffic safety, access/accessibility, sight visibility, lighting, and the built environment, and considers both the existing conditions of the Affected Area for safety and security and the proposed project features. Based on this analysis, Alternative 4 would provide a safe and secure environment for Metro patrons, pedestrians, and bicyclists. For further details on the information presented, refer to the Safety and Security Impact Analysis Report (Appendix F).

Emergency Response Services

Alternative 4 would result in a shorter alignment and fewer stations and reduced number of affected emergency responders (e.g., police, fire, and medical). However, the conditions for the emergency response services within Alternative 4 would be substantially similar to the other alternatives. The impact conclusions related to emergency response services for Alternative 1, described in Section 4.18.3.2, would also be applicable to Alternative 4. Under NEPA, Alternative 4 would not result in adverse effects related to safety and security, and mitigation would not be required.

Security and Prevention of Crime and Terrorism

While Alternative 4 would result in a shorter alignment and fewer stations than Alternatives 1, 2, and 3, the number of at-grade crossings and service frequencies would remain the same. Alternative 4 would be substantially similar to Alternative 1 in regard to security and prevention of crime and terrorism, potential impacts, and effect determinations, as described in Section 4.18.3.2. The conclusions and effect determinations provided for Alternative 1 would also be applicable to Alternative 4. Under NEPA, Alternative 4 would not result in adverse effects related to safety and security and mitigation would not be required.

4.18.3.6 Design Options—Alternative 1

Design Option 1: LAUS MWD and Design Option 2: Add Little Tokyo Station

Transit and Freight System Safety: Design Options 1 and 2 are substantially similar to the Build Alternatives in regard to transit and freight system safety conditions, potential impacts, and effect determinations. The conclusions and effect determinations provided for the Build Alternatives would also be applicable to Design Options 1 and 2. Under NEPA, Design Options 1 and 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

Motorist, Pedestrian, and Bicyclist Safety: Design Options 1 and 2 are substantially similar to the Build Alternatives in regard to motorist, pedestrian, and bicycle safety conditions, potential impacts, and effect determinations. The conclusions and effect determinations provided for the Build Alternatives would also be applicable to Design Options 1 and 2. Under NEPA, Design Options 1 and 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

Emergency Response Services: Design Options 1 and 2 are substantially similar to the Build Alternatives in regard to emergency response service conditions, potential impacts, and effect determinations. The conclusions and effect determinations provided for the Build Alternatives would also be applicable to Design Options 1 and 2. Under NEPA, Design Options 1 and 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

Security and Prevention of Crime and Terrorism: Design Options 1 and 2 are substantially similar to the Build Alternatives in regard to security and crime conditions, potential impacts, and effect determinations. The conclusions and effect determinations provided for the Build Alternatives would also be applicable to Design Options 1 and 2. Under NEPA, Design Options 1 and 2 would not result in adverse effects related to safety and security, and mitigation would not be required.

4.18.3.7 Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options

Transit and Freight System Safety: The Paramount and Bellflower MSF site options would be closed to the public and only employee-related work would occur at the selected site. The employee-related work at the MSF site options would be completed consistent with Occupational Safety and Health Administration requirements, and employees would follow the procedures in Metro's latest Rail Operating Rulebook for transit system safety. No freight operations would occur within the MSF site options. Nonetheless, the Paramount and Bellflower MSF site options are substantially similar to the Build Alternatives in regard to transit and freight system safety conditions, potential impacts, and effect determinations. The conclusions and effect determinations provided for the Build Alternatives would also be applicable to the Paramount and Bellflower MSF site options. Under NEPA, neither MSF site option would result in adverse effects related to safety and security, and mitigation would not be required.

Motorist, Pedestrian, and Bicyclist Safety: The Paramount and Bellflower MSF site options would be closed to the public and only employee-related work would occur at the selected site. Access to the MSF site options would be strictly controlled by an on-site guard and security team, as well as barriers around the perimeter of the maintenance yard to prohibit unauthorized access into the yard. Therefore, no adverse effects would occur. Under NEPA, neither MSF site option would result in adverse effects related to safety and security, and mitigation would not be required.

Emergency Response Services: The Paramount and Bellflower MSF site options would not interfere with emergency response services because there are no at-grade crossings; therefore, no adverse effects would occur. Under NEPA, neither MSF site option would result in adverse effects related to safety and security, and mitigation would not be required.

Security and Prevention of Crime and Terrorism: The Paramount and Bellflower MSF site options would be designed per the MRDC or equivalent. To deter crime and terrorism, the MSF site options would include CCTV, emergency call boxes, and the necessary lighting to provide visibility around the entire facility day and night. Access to the MSF site would be strictly controlled by an on-site guard and security team, as well as barriers around the perimeter of the maintenance yard to prohibit unauthorized access into the yard. Based on the MSF design features and operations described, no adverse effects on safety and security

to the equipment or employees at the MSF site options would occur, and mitigation measures are not required. Under NEPA, neither MSF site option would result in adverse effects related to safety and security, and mitigation would not be required.

4.18.4 Project Measures and Mitigation Measures

4.18.4.1 Project Measures

The following project measures would be required during project operation and therefore are included as part of the Build Alternatives to avoid, minimize, or reduce the potential for impacts to safety and security:

SAF PM-1 Emergency Access. Metro would coordinate access for emergency responders, locations of fire hydrants, and security features with the applicable fire and police departments in addressing fire, life, safety, and security for the proposed alignment, parking facilities, and station areas within their respective jurisdictions (Alternatives 1, 2, 3, and 4).

SAF PM-2 Security Assessments. Metro would employ an ongoing assessment of security at all WSAB station areas for possible redeployment of law enforcement and security services (Alternatives 1, 2, 3, and 4).

SAF PM-3 Freight Track Clearance. There would be a minimum 20-foot horizontal clearance between the Build Alternatives and freight track(s) where the Build Alternatives are located at-grade in shared ROW. This occurs primarily from Randolph Street to World Energy (Alternatives 1, 2, 3, and 4).

SAF PM-4 Pedestrian Bridges. Pedestrian bridges would be provided to avoid potential interactions between pedestrians and vehicle traffic at the following locations:

- East 53rd Street. WSAB and northbound A Lines go over existing bridge. Existing bridge would be above freight tracks and below WSAB viaduct (Alternatives 1 and 2).
- Paramount High School. Pedestrian tunnel connecting athletic fields to school (Alternatives 1, 2, 3, and 4).

SAF PM-5 Certification and Approval. The Build Alternatives would comply with all FTA and FRA safety and security certification processes and approval prior to the start of revenue operating services. This includes conducting a PHA and a TVA. The PHA would assess the potential hazards introduced by or associated with a design. The TVA would verify critical assets, vulnerability to specific threats, based on the likelihood of occurrence and the severity of occurrence and develop countermeasures for addressing prioritized vulnerabilities (Alternatives 1, 2, 3, and 4).

SAF PM-6 Metro Compliance. The Build Alternatives would be operated in compliance with Metro's policies, standard operating procedures, and rulebook or equivalent as approved by Metro (Alternatives 1, 2, 3, and 4).

SAF PM-7 First/Last Mile. The Build Alternatives would include first/last mile improvements around stations, such as pedestrian, bicyclist, bus stop, and Americans with Disability Act enhancements that provide safe access routes to and from the stations (Alternatives 1, 2, 3, and 4).

SAF PM-8 Fire/Life Safety Committee. A Fire/Life Safety Committee for the Build Alternatives would be established per the MRDC or equivalent and FTA requirements. The committee would be tasked with addressing fire protection requirements for the operation of the Build Alternatives, along with establishing minimum requirements that would provide for the protection of life and property from the effects of a potential fire. Additional safety and security design recommendations may be identified by the Fire/Life Safety Committee as the Build Alternatives' design progresses further during preliminary engineering and final design (Alternatives 1, 2, 3, and 4).

4.18.4.2 Mitigation Measures

The following operation-related mitigation measure would be implemented to avoid, minimize, or reduce the potential for impacts to safety and security.

SAF-1 Encroachment Detection. The Project would incorporate a means of encroachment detection along the portion of the corridor that shares right-of-way with freight operations. The encroachment detection system would detect unauthorized entry into Metro right-of-way, such as a freight train derailment. Prior to the start of service, Metro would develop a plan that outlines procedures should the encroachment detection system be triggered. In the event the intrusion detection system detects a possible derailment, all parties operating in the shared right-of-way corridor would be notified and train traffic (freight and light rail transit) would not be permitted to enter the area until the detection is investigated and the intrusion, if any, addressed to avoid possible derailments (Alternatives 1, 2, 3, and 4).

4.18.5 California Environmental Quality Act Determination

4.18.5.1 Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Project Alternative

The No Project Alternative would not include the operation of any project features and would not result in changes or impacts to adopted emergency response plans or emergency evacuation plans. Therefore, no impact would occur under the No Project Alternative, and no mitigation measures are required.

Alternative 1: Los Angeles Union Station to Pioneer Station

As described in Section 4.18.3.2, there would be changes in the Affected Area for safety and security because Alternative 1 would introduce operation of a new LRT route; however, Alternative 1 would not impair or interfere with adopted emergency response plans or evacuation plans because evacuation plans would typically avoid crossing active rail corridors (U.S. Department of Health and Human Services 2003) and the at-grade portions of Alternative 1 are located within active rail corridors. The aerial and underground segments of Alternative 1 would not impair or interfere with adopted emergency response plans or emergency evacuation plans.

Alternative 1 would include development of a comprehensive EPP, per CPUC GO 164-E, that would be integrated with local jurisdictional emergency response plans. The EPP would establish and coordinate the roles and responsibilities that would be carried out by Metro personnel and by various emergency response agencies in the event of a fire, medical, or security emergency. In addition to the EPP, a Fire/Life Safety Report would be developed to explain the safety features in the proposed tunnels and stations, the design specifics related to emergency access and egress, and the security and fire suppression systems.

Per FTA's System Safety Program Plans (49 CFR Part 659) and CPUC GO 164-E requirements, Metro would be responsible for implementing or conducting the TVA, Safety and Security Certification Plan, System Safety Management Plan provisions, and hazard analyses. Metro's Fire/Life Safety Committee would be responsible for overseeing project compliance with NFPA 130 and Metro's Fire/Life Safety Design Criteria, as well as coordination with fire jurisdictions for design reviews, training, and familiarization. The operation of Alternative 1 would not impair or interfere with emergency response and evacuation plans. Therefore, impacts for Alternative 1 would be less than significant, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.3, in regard to emergency response plans or emergency evacuation plans and potential impacts determinations. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 2. Therefore, impacts for Alternative 2 would be less than significant, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

As described in Section 4.18.3.4, Alternative 3 would result in shorter alignments and fewer stations than the other alternatives, resulting in a reduction of potential impacts to the number of emergency response plans or emergency evacuation plans. Alternative 3 would still be substantially similar to Alternative 1 in regard to emergency response plans or emergency evacuation plans and potential impacts determinations described previously. Therefore, impacts for Alternative 3 would be less than significant, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

As described in Section 4.18.3.5, Alternative 4 would result in shorter alignments and fewer stations than the other alternatives, resulting in a reduction of potential impacts to the number of emergency response plans or emergency evacuation plans. Alternative 4 would still be substantially similar to Alternative 1 in regard to emergency response plans or emergency evacuation plans and potential impacts determinations described previously. Therefore, impacts for Alternative 4 would be less than significant, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Both Design Options 1 and 2 are underground stations and would not interfere with emergency response plans or emergency evacuation plans. Therefore, no impact would occur, and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: Both the Paramount and Bellflower MSF site options would not interfere with emergency response plans or emergency evacuation plans as there are no at-grade crossings. Therefore, no impact would occur, and mitigation would not be required.

4.18.5.2 Result in substantial adverse physical impacts associated with the provisions of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain response times or other performance objectives for fire and police protection services?

No Project Alternative

The No Project Alternative would not include the operation of any project features and would not result in changes or impacts to government facilities, as well as response times for fire and police protection services. Therefore, no impact would occur under the No Project Alternative, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

As described in Section 4.18.3.2, Alternative 1 would not result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities or the need for new or physically altered government facilities in order to maintain response times or other performance objectives for fire and police protection services. Operation of Alternative 1 would not introduce the need for new or expanded facilities relative to emergency service providers, and there would not be any new buildings required for such services as a result of Alternative 1. Therefore, no impacts would occur under Alternative 1, and mitigation would not be required.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.3, in regard to impacts associated with new or physically altered government facilities to maintain response times or other performance objectives for fire and police protection services. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 2. Therefore, impacts would not occur under Alternative 2, and mitigation would not be required.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

As described in Section 4.18.3.4, while Alternative 3 would result in shorter alignments and fewer stations than Alternatives 1 and 2, Alternative 3 would be substantially similar to Alternative 1 in regard to impacts associated with new or physically altered government facilities to maintain response times or other performance objectives for fire and police protection services. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 3. Therefore, no impacts would occur under Alternative 3, and mitigation would not be required.

Alternative 4: I-105/C (Green) Line to Pioneer Station

As described in Section 4.18.3.5, while Alternative 4 would result in shorter alignments and fewer stations than Alternatives 1, 2, and 3, Alternative 4 would be substantially similar to Alternative 1 in regard to impacts associated with new or physically altered government facilities to maintain response times or other performance objectives for fire and police protection services. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 4. Therefore, no impacts would occur under Alternative 4, and mitigation would not be required.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: Both Design Options 1 and 2 are underground stations and would not result in new or physically altered government facilities to maintain response times or other performance objectives for fire and police protection services. Therefore, no impact would occur, and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Options: Both the Paramount and Bellflower MSF site options would not result in new or physically altered government facilities to maintain response times or other performance objectives for fire and police protection services. Therefore, no impact would occur and mitigation would not be required.

4.18.5.3 Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Project Alternative

The No Project Alternative would not include the operation of any project features and would not introduce or increase hazards due to geometric design or incompatible uses. Therefore, no impact would occur under the No Project Alternative, and mitigation would not be required.

Alternative 1: Los Angeles Union Station to Pioneer Station

As discussed in Section 4.18.3.2, for locations where Alternative 1 would cross streets at-grade, the addition of LRVs and an increase in the frequency of trains would be the primary new safety hazard for pedestrians, bicyclists, and vehicular traffic in the Affected Area for safety and security. This impact would be addressed through design features of the LRV, such as audible warning devices to alert pedestrians, bicyclists, and vehicular traffic that an LRV is approaching. Per the MRDC, pedestrian and bicycle traffic control and channelization techniques would also be used to control pedestrian and bicycle movements at intersections and encourage the use of designated crossings through pedestrian gates and crosswalks. In addition, Metro would prepare grade crossing applications for approval by the CPUC and in coordination with local public agencies, such as city and county fire departments. Following review of grade crossing applications, additional safety and security design features may be incorporated if necessary. Impacts would be further reduced through the incorporation and application of the MRDC or equivalent, CPUC rail crossing rules and regulations, and MUTCD requirements. In addition, FTA-required hazard analyses would be prepared during preliminary engineering and final design stages of the Project to identify specific hazards and may include features described in Section 4.18.3.2 for enhanced pedestrian and bicyclist

safety. Therefore, impacts related to motorist, pedestrian, and bicycle safety would be less than significant for Alternative 1, and no mitigation measures are required.

The LRT operations and stations of Alternative 1 would also share ROW with freight operations, which could result in impacts. Safety requirements would be established in accordance with FTA and FRA regulations (49 CFR 659), CPUC GO 164-E and GO 143-B requirements, the MRDC or equivalent, and with additional input from the freight operators for safety elements. The Project would also operate in accordance with Metro system safety plans, policies, and procedures, including the following: Metro System Safety Program Plan, Metro System Security Plan, Metro Standard Emergency Operating Procedures, and the Metro Rail Operating Rulebook. The direction included in these safety plans, policies, and procedures is summarized in Section 4.18.3.2.

The safety characteristics would reduce the potential for conflicts between freight and LRT service; however, impacts would not be completely avoidable and considered significant. Therefore, Mitigation Measure SAF-1 (Encroachment Detection) has been identified so that additional safety measures are incorporated to lower impacts from LRT operations and freight operations within shared ROW to less than significant levels.

Alternative 1 would provide security features to support the prevention of crime and terrorism, as described in Section 4.18.3.2. Alternative 1 would comply with Metro's MRDC or equivalent and security plans, incorporate CPTED features, and include security patrols to minimize potential security concerns associated with criminal and terrorist activities. Design features, and operational security features and requirements would help prevent crime and terrorism; therefore, it would be a less than significant level for Alternative 1.

Mitigation Measures: Mitigation Measure SAF-1 (Encroachment Detection)

Impacts Remaining After Mitigation: Less than significant.

Alternative 2: 7th Street/Metro Center to Pioneer Station

Alternative 2 is substantially similar to Alternative 1, as described in Section 4.18.3.3, in regard to impacts associated with hazards due to geometric design or incompatible uses described previously. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 2. Therefore, impacts would be significant under Alternative 2 and Mitigation Measure SAF-1 (Encroachment Detection) would be required to reduce impacts, specific to shared ROW with freight operations, to less than significant.

Mitigation Measures: Mitigation Measure SAF-1 (Encroachment Detection)

Impacts Remaining After Mitigation: Less than significant.

Alternative 3: Slauson/A (Blue) Line to Pioneer Station

As described in Section 4.18.3.4, while Alternative 3 would result in shorter alignments and fewer stations than Alternatives 1 and 2, Alternative 3 would be substantially similar to Alternative 1 in regard to impacts associated with hazards due to geometric design or incompatible uses described previously. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 3. Therefore, impacts would be significant under Alternative 3 and Mitigation Measure SAF-1 (Encroachment Detection) would be required to reduce impacts, specific to shared ROW with freight operations, to less than significant.

Mitigation Measures: Mitigation Measure SAF-1 (Encroachment Detection)

Impacts Remaining After Mitigation: Less than significant.

Alternative 4: I-105/C (Green) Line to Pioneer Station

As described in Section 4.18.3.5, while Alternative 4 would result in shorter alignments and fewer stations than Alternatives 1, 2, and 3, Alternative 4 would be substantially similar to Alternative 1 in regard to impacts associated with hazards due to geometric design or incompatible uses described previously. The conclusions and impact determinations provided for Alternative 1 would also be applicable to Alternative 4. Therefore, impacts would be significant under Alternative 4 and Mitigation Measure SAF-1 (Encroachment Detection) would be required to reduce impacts, specific to shared ROW with freight operations, to less than significant.

Mitigation Measures: Mitigation Measure SAF-1 (Encroachment Detection)

Impacts Remaining After Mitigation: Less than significant.

Design Options—Alternative 1

Design Option 1: LAUS at MWD and Design Option 2: Add Little Tokyo Station: As described in Section 4.18.3.6, both Design Options 1 and 2 would be designed per the MRDC or equivalent and would not introduce or increase hazards due to geometric design features or incompatible uses. Therefore, no impact would occur, and mitigation would not be required.

Maintenance and Storage Facility

Paramount and Bellflower MSF Site Option: As described in Section 4.18.3.7, both the Paramount and Bellflower MSF site options would be designed per the MRDC or equivalent and would not introduce or increase hazards due to geometric design features or incompatible uses. Therefore, no impact would occur, and mitigation would not be required.